

FORM PTO-1390 (REV. 10-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER R0346/7028
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			U.S. APPLICATION NO. (If known, see 37 CFR 1.5) <b>09/890205</b>
INTERNATIONAL APPLICATION NO. PCT/GB99/03010	INTERNATIONAL FILING DATE 10 September 1999 (10.09.99)	PRIORITY DATE CLAIMED 27 January 1999 (27.01.99)	
TITLE OF INVENTION BROADCAST MEDIA METADATA STRUCTURE			
APPLICANT(S) FOR DO/EO/US CHAN, David, ORMOROD, Tracey-Anne, OWENS, Carol Janet, MCGREGOR, Diane Marie, CURTIS, Wesley Jonathan, JORDAN, Smith John, HAYNES, Arthur Brian			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
<ol style="list-style-type: none"> <li><input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li><input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li><input checked="" type="checkbox"/> This is an express request to promptly begin national examination procedures (35 U.S.C. 371(f)).</li> <li><input type="checkbox"/> The US has been elected by the expiration of 19 months from the earliest claimed priority date (PCT Article 31).</li> <li><input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)).             <ol style="list-style-type: none"> <li><input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</li> <li><input type="checkbox"/> has been transmitted by the International Bureau.</li> <li><input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</li> </ol> </li> <li><input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).             <ol style="list-style-type: none"> <li><input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</li> <li><input type="checkbox"/> has been transmitted by the International Bureau.</li> </ol> </li> <li><input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).             <ol style="list-style-type: none"> <li><input type="checkbox"/> are attached hereto (required only if not transmitted by the International Bureau).</li> <li><input type="checkbox"/> have been communicated by the International Bureau.</li> <li><input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</li> <li><input checked="" type="checkbox"/> have not been made and will not be made.</li> </ol> </li> <li><input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</li> <li><input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</li> <li><input type="checkbox"/> An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(C)(5)).</li> </ol>			
<b>Items 11. To 16. Below concern document(s) or information included:</b>			
<ol style="list-style-type: none"> <li><input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</li> <li><input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</li> <li><input checked="" type="checkbox"/> A <b>FIRST</b> preliminary amendment.</li> <li><input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.</li> <li><input type="checkbox"/> A substitute specification.</li> <li><input type="checkbox"/> A change of power of attorney and/or address letter.</li> <li><input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821-1.825.</li> <li><input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4).</li> <li><input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).</li> <li><input checked="" type="checkbox"/> Other items or information: Copy of PCT Published Application w/Search Report Copy of International Preliminary Examination Report Copy of PCT/RO/101 Copy of PCT/IPER/401 (CH II Demand) Copy of International Search Report</li> </ol>			
Express Mail Label No. EL19464815US Date Mailed: 26 July 2001			

JC17 Rec'd PCT/PTO 26 JUL 2001

U.S. APPLICATION (Under 37 CFR 1.53)		INTERNATIONAL APPLICATION PCT/GB99/03010		ATTORNEY'S DOCKET NUMBER R03467028	
09/890205				CALCULATIONS PTO USE ONLY	
21. <input type="checkbox"/> The following fees are submitted: <b>BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)):</b> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1000.00  International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$860.00  International preliminary examination fee (37 CFR 1.482) not paid to USPTO but but international search fee paid to USPTO (37 CFR 1.445(a)(2)) paid to USPTO \$710.00  International preliminary examination fee paid to USPTO (37 CFR 1.482) But all claims did not satisfy provisions of PCT Article 33(1)-(4) \$690.00  International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 <b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>					
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$860.00	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total Claims	36 - 20 =	16	X \$18.00	\$288.00	
Independent Claims	5 - 3 =	2	X \$80.00	\$160.00	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+\$270.00	\$0.00	
<b>TOTAL OF ABOVE CALCULATIONS =</b>				\$1308.00	
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				\$	
<b>SUBTOTAL =</b>				\$1308.00	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
<b>TOTAL NATIONAL FEE =</b>				\$1308.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate coversheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$	
<b>TOTAL FEES ENCLOSED =</b>				\$1308.00	
				Amount to be refunded	\$
				charged	\$
a. <input checked="" type="checkbox"/> A check in the amount of \$ 1308.00 to cover the above fees is enclosed.					
b. <input type="checkbox"/> Please charge my Deposit Account No. _____ In the amount of \$ _____ To cover the above fees. A duplicate copy of this sheet is enclosed.					
c. <input checked="" type="checkbox"/> The commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 23/2825. A duplicate of this sheet is enclosed.					
d. <input type="checkbox"/> Fees are to be charged to a credit card. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.					
<b>NOTE:</b> Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.497) (a) or (b) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO					
WOLF, GREENFIELD & SACKS, P.C. 600 Atlantic Avenue Boston, Massachusetts 02210 Tel: (617) 720-3500					
SIGNATURE _____ Ronald J. Kransdorf NAME					
20.004 REGISTRATION NO					
CUSTOMER NUMBER 23628					

Express Mail Label EL 819464815 US  
Date of Mailing: July 26, 2001

ATTORNEY DOCKET NO: R0346/7028 RJK

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: David Chan, et al.  
Serial No: Not yet assigned  
Filed: Herewith  
For: BROADCAST MEDIA METADATA STRUCTURE

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8(a)

The undersigned hereby certifies that this document is being placed in the United States mail with first-class postage attached, addressed to Box PCT, Commissioner for Patents, Washington, D.C. 20231 on the 26<sup>th</sup> day of July 2001.

BOX PCT  
Commissioner for Patents  
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Kindly amend the attached patent application as follows:

In the Specification

Please replace the paragraph beginning at line 25 of page 28 as shown.

The data structure is typically implemented in software, for example the data dictionary may be held in a software repository. However, this is not a limitation on the invention and the data structure may, in appropriate cases, be implemented in hardware or in a hardware/software hybrid.

Please add the following paragraph at the end of page 28.

While the invention has been particularly shown and described above with reference to a preferred embodiment, the foregoing and other changes in form and detail may be made therein

by one skilled in the art while still remaining within the spirit and scope of the invention which is to be defined only by the appended claims.

In the Claims:

Please rewrite claim 29 as shown.

29. (Amended) A structure according to claim 18 comprising entities relating to editorial requirements and entities relating to instantiation requirements.

REMARKS

The above amendments are being made to place this application in better form under U.S. practice, and in particular to eliminate multiple dependent claims. Entry of these amendments is respectfully requested.

Respectfully submitted,

*David Chan, et al., Applicants*

By:

  
Ronald J. Kransdorf, Reg. No. 20,004  
Wolf, Greenfield & Sacks, P.C.  
600 Atlantic Avenue  
Boston, Massachusetts 02210-2211  
Tel. No.: (617) 720-3500  
Attorney for Applicant

Docket No. R0346/7028 RJK  
Date: July 26, 2001  
x7/27/01x

MARKED-UP CLAIMS

29. (Amended) A structure according to [any of claims] claim 18 [to 28] comprising entities relating to editorial requirements and entities relating to instantiation requirements.

**MARKED-UP SPECIFICATION**

Please replace the paragraph beginning at line 25 of page 28 as shown.

The data structure is typically implemented in software, for example the data dictionary may be held in a software repository. However, this is not a limitation on the invention and the data structure may, in appropriate cases, be implemented in hardware or in a hardware/software hybrid.

Please add the following paragraph at the end of page 28.

While the invention has been particularly shown and described above with reference to a preferred embodiment, the foregoing and other changes in form and detail may be made therein by one skilled in the art while still remaining within the spirit and scope of the invention which is to be defined only by the appended claims.

PTO/PCT Rec'd 26 JUL 2001

- 1 -

BROADCAST MEDIA METADATA STRUCTURE

## FIELD OF THE INVENTION

This invention relates to methods and systems for storing and exchanging metadata, or data about data, between  
5 systems. It is particularly, but not exclusively, concerned with the storage and exchange of metadata associated with media materials, concepts and services within the context of media production and distribution, and its future evolution.

## BACKGROUND TO THE INVENTION

10 The changes brought about in the broadcasting industry by the move to digital technology in all aspects of media production and distribution has exposed significant shortcomings in traditional and existing methods and systems.

The proliferation of distribution channels, using both push and pull technologies, has led to an increased demand for media content which cannot be serviced economically through original production alone but relies heavily on re-use. Information is the key to un-locking the re-use value of material, yet the industry has no agreed approach to  
15 generating and structuring this crucial data, or metadata, to enable efficient exchange of material between process stages or business parties.

The move away from analogue or physical media capture and storage formats towards digital video, audio, text, stills,  
25 graphics and software has created new problems in terms of identifying and managing materials and tracking copyright intellectual properties across multiple incompatible and non-interoperating formats and systems. A video tape, in a box with a label, is a physical object which is managed  
30 through well-understood logistical methods. When the video information is transferred as digits into an Information Technology repository such as a server, it cannot be

- 2 -

distinguished from any other data, whether media or business data.

Such data is not self-identifying; it requires additional metadata to give it meaning, context and value, and that information must be available at any stage during the media production and distribution lifecycle. The lack of common description and management protocols in computer-based systems and among users in the Media domain has already led to loss of material, errors in retrieval and distribution, and accidental copyright infringement.

The emerging capability of digital media formats to support embedded metadata offers an opportunity to attach business information to the audio or video for example, but if there are no standards for generation and exchange of metadata, serious inefficiencies will proliferate and solutions will be hard to find. In addition, early industry thinking about metadata development reflected a view that all metadata might have to be encoded on every section of media however small, such as a video frame or equivalent increment. Thus the business and technical metadata volumes could easily dwarf the media item, making huge demands on storage and slowing down access time, making metadata systems unviable.

At a time when information accuracy and accessibility, and business agility are increasingly vital for the media industry, the new converging technologies are causing fragmentation, data loss, and over-loading on labour-intensive human "fixes". This chaos is exacerbated by the proprietary approaches taken by individual equipment vendors, all with different systems supporting only partial solutions.

Although there are some industrial initiatives underway to stimulate a more open approach, what has been lacking to date has been an overall understanding of the requirements.

- 3 -

The starting point must be an architectural framework which defines the way in which all the information needed to support media production and distribution in the digital domain (while not excluding analogue technology) can be effectively structured and exchanges between process stages and business parties, and linked the with media to which it relates. Inter-operable systems can then be built to support that architecture, and metadata can be managed efficiently in terms of storage and transfer.

## 10 SUMMARY OF THE INVENTION

The invention, therefore, aims to provide such an architecture. According to the invention there is provided a method for defining a metadata structure relating to media materials, concepts and services, the method comprising the steps of: defining a plurality of storage entities at a plurality of levels for metadata relating to media materials, concepts and services, the storage entities having a plurality of storage elements and being related with a media metadata subject grouping, and arranged in hierarchical and non-hierarchical relationships allowing an appropriate combination of elements as required; storing metadata relating to a given storage entity in one of a plurality of storage elements of the entity at that level, each storage element representing an attribute or characteristic of the entity subject or media material; arranging media metadata entities and attributes relating directly to the media material, concepts and services in hierarchical and non-hierarchical entity level relationships allowing an appropriate combination of elements are required; and wherein for hierarchical entities, the storage elements of storage entities at a level apart from the lowest level, comprise the storage elements of the immediately lower storage level.

The invention further provides a data structure for defining broadcast media metadata comprising: a plurality of storage

- 4 -

entities for metadata relating to media materials, concepts and services, the entities being arranged in storage levels and each entity comprising a plurality of storage elements each for storing metadata relating to a given entity, each  
5 storage element representing an attribute or characteristic of the entity subject or the media material; wherein the storage levels are hierarchical and non-hierarchical allowing the appropriate combination of elements as required, where the levels are hierarchical, the storage  
10 elements of storage entities, apart from the lowest level, comprise the stores of the immediately lower storage level.

The invention still further provides a data structure for defining media metadata comprising: a plurality of storage  
15 entities for metadata relating to media production and distribution, the entities being arranged at storage levels and each entity comprising a plurality of storage elements each holding metadata relating to a given entity level, each storage element representing an attribute or characteristic of the entity subject or the media material; a plurality of  
20 levels of business entities each comprising storage elements storing business metadata, the business entities being linked to the metadata stores at a storage level dependent on the business element metadata, one of the plurality of levels of business stores comprising a rights level and  
25 having one or more storage entities containing business metadata identifying legal rights attached to the media material, the business metadata including the legal jurisdiction of the right, the geographical territory of the right, the duration of the right and the owner of the right; wherein the metadata storage levels are hierarchical and  
30 non-hierarchical and, for hierarchical storage levels, the metadata stored in the storage elements of storage entities at a level, apart from the lowest level comprise the stores of the immediately lower storage level.

- 5 -

The invention also provides a data structure for defining media metadata comprising: a plurality of storage entities for metadata relating to media production and distribution, the entities being arranged at storage levels and each entity comprising a plurality of storage elements each holding metadata relating to a given entity level, each storage element representing an attribute or characteristic of the entity subject or the media material; a rights store linked to at least one of the metadata stores and comprising one or more storage entities containing business metadata identifying legal rights attached to the media material, the business metadata including the legal jurisdiction of the right, the geographical territory of the right, the duration of the right and the owner of the right; wherein the metadata storage levels are hierarchical and non-hierarchical and, for hierarchical storage levels, the metadata stored in the storage elements of storage entities at a level, apart from the lowest level, comprise the stores of the immediately lower storage level.

A method embodying the invention may define a metadata structure relating to media material, concepts and services, which in turn provides a method for defining storage and exchange requirements.

The method comprises of the steps of defining a plurality of storage entities for metadata related to media production and distribution, the entities being associated with a media metadata subject grouping, and arranged in hierarchical and non-hierarchical relationships. Metadata relating to a given storage entity is organised in one of a plurality of storage elements at that level, each element representing an attribute or characteristic of the entity subject or media material.

Media metadata entities and attributes relating directly to media material, concepts and services are arranged

- 6 -

hierarchically and non-hierarchically allowing the appropriate combinations of metadata to be supported. Where storage levels are hierarchical, the storage elements in stores at the lower levels are linked in defined relationships with stores at the higher levels. The result is a structure for defining metadata, wherein all individual metadata values may be organised according to the entities and relationships defined.

A data structure embodying the invention may define the business data not directly related to media material but vital for its management and exploitation, by defining a plurality of business entities each comprising business elements storing business data, the business stores being related to the media metadata stores at a level dependent on the business element metadata. One or more of a plurality of entities comprises a rights storage entity or entities containing business metadata identifying legal rights attached to the media material, wherein the relationships with the appropriate media metadata are recorded. Where storage levels are hierarchical, the storage elements in stores at the lower levels are linked in defined relationships with stores at the higher levels.

The invention also provides a method of defining a standard media exchange framework comprising the steps of: storing media metadata by the method defined above; defining industry-specific processes involved in media production and distribution, and defining the flow of data between them. The metadata defined by the metadata structure may be mapped on to this process flow, in order to define metadata exchange requirements between different process stages and business areas.

A method embodying the invention may define media metadata and related business metadata exchange requirements by using the process flow definitions on to which the storage

- 7 -

entities may be mapped, so that the systems requirements at each interface may be identified against a standard structure, providing a framework for systems development and integration. In providing the hierarchical and non-hierarchical structure of storage entities and attributes, the method and data structure serves as a basis for defining standard media metadata exchange requirements between process and business interfaces at an appropriate level of granularity.

Embodiments of the invention have the advantage that metadata related to a media item can be stored in a manner which minimises storage space and minimises retrieval time. A metadata item for a media item need only be stored once and is retrievable at any point in the broadcast media chain. Furthermore, embodiments of the invention allow media exchange formats to be defined which embed certain metadata in the media object, for example into a video frame from where they can be accessed at any point in the broadcast chain.

The term media concept referred to herein refers to an idea for a media item such as a television programme or series of programmes independent of its realisation. It is common in the media industry to buy, sell and licence media concepts and as such they may be regarded as intellectual property.

#### BRIEF DESCRIPTION OF DRAWINGS

Embodiments of the invention will now be described by way of example, and with reference to the accompanying drawings, in which:

Figure 1a), 1b) and 1c) show three views of an Entity Relationship Diagram embodying the invention;

Figure 2 is an overall process flow diagram illustrating broadcast media production and distribution;

- 8 -

Figure 3 shows in more detail the CREATE TV/RADIO PROGRAMME process box of figure 2;

Figure 4 shows in more detail the GATHER NEWS process box of figure 2;

- 5      Figure 5 shows the RESEARCH EVENT process of figure 4 in more detail;

Figure 6 shows ALLOCATE RESOURCES process of figure 4 in more detail;

- 10      Figure 7 shows the CREATE NEWS PROGRAMMES process of figure 2 in more detail;

Figure 8 shows the SELECT PROGRAMME CONTENT process of figure 7 in more detail;

Figure 9 shows the RESEARCH AND CAPTURE process of figure 7 in more detail;

- 15      Figure 10 shows the COMMISSION OUTPUT process in more detail;

Figure 11 shows the EVALUATE and SELECT OFFERS process in figure 10 in more detail;

- 20      Figure 12 shows the DEVISE OUTLINE SCHEDULE process of figure 10 in more detail;

Figure 13 shows the ACQUIRE PROGRAMME/EVENT RIGHT process of figure 2 in more detail;

Figure 14 shows the SCHEDULE & PROMOTE process of figure 2 in more detail;

- 9 -

Figure 15 shows the CREATE TRANSMISSION SCHEDULE process of figure 14 in more detail;

Figure 16 shows the PLAN & INITIATE ON-AIR PUBLICITY process of figure 14 in more detail;

- 5      Figure 17 shows the PLAY-OUT AND TRANSMIT process of figure 2 in more detail;

Figure 18 shows the PERFORM PLAY-OUT process of figure 17 in more detail;

- 10      Figure 19 shows the MANAGE MATERIAL STORE and ARCHIVE process of figure 2 in more detail;

Figure 20 shows the MANAGE INCOMING MATERIAL process of figure 19 in more detail;

Figure 21 shows the RETRIEVE MATERIAL process of figure 19 in more detail;

- 15      Figure 22 shows the MANAGE RIGHTS AGENCY process of figure 2 in more detail;

Figure 23 shows the PLAN OUTPUT process of figure 2 in more detail;

- 20      Figure 24 shows the UNDERSTAND AUDIENCE & COMPETITORS process of figure 2 in more detail;

Figure 25 shows the MANAGE RESEARCH STATISTICS process of figure 24 in more detail;

Figure 26 shows the HANDLE AUDIENCE FEEDBACK process of figure 24 in more detail;

- 10 -

Figure 27 shows the DEAL WITH AUDIENCE FEEDBACK process of figure 24 in more detail; and

Figure 28 shows the PROVIDE RESOURCES TO PROGRAMMES process of figure 2 in more detail.

5 DESCRIPTION OF BEST MODE

In the entity relationship diagram of figures 1a) to 1c), it is shown how a media material item such as a television programme may be described as an interrelated series of entities. The term media material includes any logical whole piece of media for distribution. It may, for example, be a news item, a section of video, a series of data or software or audio. In figure 1a), the central entity is the EDITORIAL OBJECT VERSION 10 together with its sub-types PROGRAMME VERSION 11 and ITEM VERSION 12 (it is assumed that these are included whenever the main entity 10 is referred to). An entity is a logical grouping of data to be stored, retrieved and used. This data is all programme and item metadata as it describes a characteristic or attribute of the PROGRAMME or EDITORIAL OBJECT VERSION. The entity contains a number of data items. Thus, the EDITORIAL OBJECT VERSION entity 10 holds both key and non-key data. The key data for the EDITORIAL OBJECT VERSION entity is the EO count PK1 and EOC number PK2 which together make up a unique identifier. The tags PK1 and PK2 show the two parts of the primary key. For data to be allocated a primary key it should be unique in its own right or unique when taken with another data item. The primary key is the "way-in" to the information contained within the entity. It can be seen from figure 1a) that all the entities contain key data. Key data is essential to those entities. An entity might only hold key data.

The EDITORIAL OBJECT CONCEPT entity 20 is an example of an entity which holds key metadata which is unique in its own right. Thus, the primary key is simply EOC number PK1.

- 11 -

In EDITORIAL OBJECT VERSION entity 10, the non-key data relates to editorial information about the programme or item, such as the title, working title, synopsis, etc. Technical information about an EDITORIAL\_OBJECT\_VERSION is found through other entities such as EDITORIAL\_OBJECT\_VERSION\_INST 30 and MEDIA\_OBJECT\_INSTANCE 32. The term instance refers to a unique material embodiment of an editorial or media object, whether electronic or physical (eg film), signal stream or file. Different instances can exist of the same object, with different technical attributes.

THE EDITORIAL OBJECT VERSION entity 10 is linked to a number of other entities. As the programme or item is the end product of the creation process, it follows that the vast majority of the other entities will, either directly or indirectly, be linked to the EDITORIAL OBJECT VERSION 10.

The link between entities is a relationship, with the link line showing how the data is related. At the end of the relationship line are two symbols indicating whether the connection is mandatory and whether only one or many connecting entities are to be supported. A particular relationship with only a single symbol indicates an entity being a subtype of another entity.

In the example of figure 1a), the EDITORIAL OBJECT VERSION entity 10 is linked to a number of other entities such as the entity EDITORIAL OBJECT CONCEPT 20, the relationship being that the EDITORIAL OBJECT CONCEPT may give rise to a number of EDITORIAL OBJECT VERSIONS. The EDITORIAL OBJECT VERSION PROGRAMME is linked to the entity SOUND, FORMAT, TYPE, 27, the relationship being "may describe". The EDITORIAL OBJECT VERSION entity 10 is linked to the EDITORIAL OBJECT VERSION INST entity 30 by the relationship "may be instantiated as". A wide variety of terms may be used to describe relationships between entities and the

- 12 -

terms vary from the very specific, such as "is made up of" to the more vague, such as "has associated".

Many of the entities having relationships with the EDITORIAL OBJECT VERSION 10 in turn have relationships with other entities some of which have relationships with the EDITORIAL OBJECT VERSION entity 10. Thus, the EDITORIAL OBJECT CONCEPT entity 20 has the relationship "may be specified in" with the OFFER LINK EOC entity which in turn has the relationship "may specify" with the OFFER entity 28 which has the relationship "may specify as examples" with the OFFER\_LINK\_EOV\_EXAMPLE entity 67. That latter entity has the relationship "may be specified as examples in" with the EDITORIAL OBJECT VERSION entity 10.

The entity relationship diagrams of figures 1a)-1c) provide a hierarchical and non-hierarchical breakdown of programme content and metadata through media object instances which point to individual media objects. The structure also allows optimal storage of information by linking information to objects at the logical level. Thus, rights, incorporating contributor rights and/or exploitation rights are linked to programmes and at lower levels, through a contract for a particular role, such as rights owner. Thus it can be seen that not all programme metadata need be stored at a very low level, such as on a video frame, as has previously been proposed. The model sets out the entities required to hold metadata for say, a programme at the optimal level, not, for example, duplicating it across low level details such as video frames.

Figures 1a) to 1c) set out the range of metadata hierarchical relationships necessary to support appropriate media metadata structures.

The EDITORIAL\_OBJECT\_VERSION entity 10 may be instantiated in terms of a number of media object instances which

- 13 -

represent the physical make up of the item. These are represented by the MEDIA\_OBJECT\_INSTANCE entity 32. The media object instance is connected to only one of a number of different elements such as shots, audio clip, text, graphics and stills which are determined through the relationship to the entity MEDIA\_OBJECT\_CONTENT entity 31 to MEDIA OBJECT entity 14 and its associated sub-types. Thus a given media object instance only comprises shots, or stills, etc. Each of these are represented by their own entity.

5      Stored at each level is metadata relating to the media item at that level. These storage elements can then be combined upwards in a hierarchical and non-hierarchical structure with the data stored at each level being appropriate to that level. Thus, a given piece of metadata only needs to be

10      stored once throughout the whole broadcast chain from commissioning of a programme to transmission and exploitation.

In the digital environment, business and technical data become indistinguishable. It is an advantage of the embodiment that business information can be linked to the appropriate level entity. This again reduces the amount of storage required and avoids the need for business information to be embedded in the individual video or audio frames. One example of this is the STORY entity 25 which is

20      linked to the MEDIA OBJECT and EDITORIAL OBJECT entities 14, 10 via link entities. If the previously assumed constraints were followed, this data would have been embedded at the frame level.

The manner in which the model handles rights is itself novel. As can be seen from figure 1c, the RIGHT entity 61 has RIG number and COM number as key data, and jurisdiction, start date, end date, and condition as non-key data. The condition data item is included to provide a field for storage of additional information required to

30      define the right over and above the jurisdiction, and other

35

- 14 -

provided for. The RIGHT entity 61 is linked to the TERRITORY entity 63 through the RIGHT LINK TERRITORY entity 72 along the relationship "is valid in". This allows a series of pre-defined territories for rights management to be specified.

5

Within an organisation's development local equivalent names would be defined as synonyms for the terms used here, different parts of the broadcasting industry may use different terminology. The data dictionary is therefore a compendium of data items with their definitions (complemented with local synonyms) and provides a basis to all the items a broadcaster needs to know about a media item throughout its life cycle with flexibility to cope with specialised terminology and future developments.

10

15

The structure of the data model described has hierarchical and non-hierarchical areas representing different levels of granularity through brand, programme group, programme, item and media objects. The entities are linked by relationships that support the expected connections across sets of metadata necessary to support business functionality. Each of the metadata items in figures 1a) to c) would appear in the data dictionary. Relationships linking data elements to the programme entity provide its CV or Résumé.

20

25

In figure 1a), the MEDIA OBJECT entity 14 is shown as having five different sub-types: SHOT entity 15, AUDIO CLIP entity 16, TEXT entity 17, GRAPHIC entity 17 and STILL entity 19. Each of these sub-type entities contain metadata relating to the subtype. Thus, the AUDIO CLIP entity contains audio metadata, the GRAPHIC entity, graphic metadata etc.

30

Each of the entities may be realised as a storage entity having a series of storage elements.  
Each of the entities may be realised as a storage entity having a series of storage elements.

- 15 -

An example of the metadata contained in the entity MEDIA OBJECT 14 is as follows:

**KEY DATA**

MOB Identifier {PK1}

**NON-KEY DATA**

MOB Title

MOB Creation Date

MOB Creation Time

MOB Description

Format

Original Format

- 5 Examples of entries from the data dictionary for some of the entities shown in figures 1a), b) and c) are as follows:

**AUDIO CLIP (16)**

- The entity represents an editorial description of a section of continuous/discrete sound from a defined viewpoint. The sound may be being planned to be captured, edited, or transmitted.
- 10

**BRAND (22)**

- The name applied to a collection of assets which could include a series of programmes. The assets could cover programmes, books, videos, characters, magazines, toys etc.
- 15
- A brand can be defined at a high level as BBC Sport or as a sub-Brand as Grandstand.

**BRIEF (41)**

- The document used by a Commissioning Editor to describe the programme or programmes required for publication.
- 20
- Also known as Commissioning Brief.

**GENRE (39)**

- 16 -

A domain-specific conceptual grouping of programmes, e.g. comedy, drama etc. It is because genres are domain specific that a single programme concept may be described in terms of multiple genres.

#### 5      **PROGRAMME CLASSIFICATION (29)**

Used to describe the functional type of programme, for example ordinary scheduled programme, trail, time signal, outlet ident.

#### 10     **PROGRAMME GROUP (21)**

10     A grouping of programmes with shared identification and branding linked by common character, subject matter, style or story. Could be a series, serial or themed grouping. A fiction series (drama or comedy) will have common characters, themes and/or style between episodes, but  
 15     individual stories. A fictional series will have a common story running across all episodes, with part being told in each. A factual series may have either individual or shared stories/arguments, such as a history series. A series may be occasional or regular in its transmission pattern - a serial  
 20     will always have a prescribed transmission pattern and order. A themed group may draw together programme versions based around a campaign or anniversary.

#### 25     **PROGRAMME TYPE (24)**

Programme Type is the category of programme type taken from a standardised list for transmission to the consumer.  
 25     Commonly used in RDS delivery, DAB delivery and MPEG-2 delivery. Programme types include News, Sport, Traffic Information, Pop, Classical, with further sub-categorisation. Also used for EPGs.

#### 30     **PUBLICATION EVENT (42)**

This is the window of availability for a consumer to view or listen to a version of a Programme.

- 17 -

**RIGHT (61)**

An interest, or permission, which is recognised and protected by law. This entity records the detail of each right which has been acquired for exploitation purposes.

**SHOT (15)**

The entity provides the editorial description for a continuous section of moving images from a defined viewpoint, such as video or film. The section may be planned, captured, created from other recorded images or transmitted.

**STILL (19)**

An editorial description of an image with no duration, but persistence e.g. a photo, or single frame extracted from a shot. The description may apply to a still image that is planned to be taken, captured, edited or transmitted.

**SUBJECT REFERENCE (43)**

This reference applies to the subject of the material (compared with, for example, the contributors or the action location) and is a "tag" by which a user may retrieve the material.

**TEXT (17)**

The entity provides an editorial description for a media object that contains alphanumeric content to be included in a presentation e.g. captions, website text, teletext.

To assist in understanding how the data model operates it is helpful to consider a media object such as footage of wildlife. At the MEDIA OBJECT entity level information about this footage is stored such as the identifier, its name, creation date etc as shown in figure 1(a). A simple

- 18 -

object represents a continuous stream of action. Media objects may only exist conceptually, that is they may not have been captured. When an object is captured the data held at the level of the MEDIA OBJECT entity is complemented by technical information about the digital representation of the action stored in the MEDIA OBJECT CONTENT and MEDIA OBJECT INSTANCE entities 31 and 32. The combination of simple objects to become footage, or to become a compound media object is represented in the MOI SEGMENT USAGE entity 33, the complementary information about any processing applied being stored in the TRANSFORM and TRANSITION entity 38.

The audio clip used, for example in the signature tune for one of the programmes may have rights attached to it and may have been used for other programmes.

Prior to the present invention it was an assumed constraint that all the data represented by the footage would either be to store all of it for each frame of each shot or for it to be largely lost or stored in many places simultaneously. The first of these results in vast storage requirements and the second also has large storage overheads as well as being undesirable. The data model represented by figures 1a) to c) requires each metadata item to be stored only once and the hierarchical and non-hierarchical relationships between the storage objects means that all the information can be retrieved as required. Thus at the programme level one can access all the shot information and at the shot level one can access all the programme information for which that shot has been used. Given the shot data, one can move up the hierarchy through the MEDIA OBJECT, CONTENT, MEDIA OBJECT INSTANCE, EDITORIAL OBJECT VERSION INST and PUBLICATION EVENT entities 31-32 to find out when and in what form the shot has been broadcast.

- 19 -

The data model gives a representation of the data required by media business processes. The actual processes can be represented by process flow diagrams. Process flow diagrams consist of process, data flows, data stores, and external entities and illustrate the process involved in the broadcast media production chain. In a process box, the action is linked with nouns to describe the process. The diagram does not show how many times the process is executed or any conditions that may prevent the process from being executed. However, the process must be triggered by a data flow. A data flow carries data in a packet into and out of processes and must change the data in some way. The data on the data flow is broken down into data structures and data items/elements. Data may flow to and from an external entity which is a source or recipient of data.

An external entity is a person, role organisation or body that is outside the area represented by the process flow diagram and not necessarily to the organisation as a whole. A data store is a repository (possible temporary) of data. Everything in it should be retrieved and used by a process somewhere and data stored must be placed there by a process. Figure 2 shows the content creation and distribution process flow diagram for a broadcasting organisation. Figures 3 - 28 show process flow diagrams for each of the processes illustrated in figure 2.

Thus the content creation and distribution process is broken down into twelve processes. Each of these processes are in turn broken down into a number of sub-processes. Central to this is CREATE TV/RADIO PROGRAMME 72 which has data flows from sources 74, 76 which represent an external archive and a contributor. The data flow from the archive 74 represents information and footage. Data flows both from and to the contributor, the flow into the contributor being contractual and the flow from the contributor being availability. There

- 20 -

is further flow of data to an external entity 77 representing billing to broadcasting data services.

The process 72 has a data flow between the process PROVIDE RESOURCES to PROGRAMMES 78, the flow from the CREATE TV/RADIO PROGRAMME process 72 representing bookings and demand forecast and the flow to the process representing resources, equipment, studios and quotes.

The process CREATE TV/RADIO PROGRAMME 72 has data flow to the process COMMISSION OUTPUT 82 with data representing offers flowing from the CREATE TV/RADIO PROGRAMME 72 process to the commission output process and data representing commissioning brief, and offer response flowing to the CREATE TV/RADIO PROGRAMME process. Data included in production contract will flow both ways. The CREATE TV/RADIO PROGRAMME process 72 will exchange data with the PLAY-OUT and TRANSMIT process 84 with the flow of data to PLAY-OUT and TRANSMIT process 84 representing programme feed and the data flow to the CREATE TV/RADIO PROGRAMME 72 representing a confirmed transmission. The data will flow from the CREATE TV/RADIO PROGRAMME process 72 to the process SCHEDULE and PROMOTE 86. That flow represents promotional material and presentation details.

Data is exchanged between the CREATE TV/RADIO PROGRAMME 72 process and the MANAGE MATERIAL STORE & ARCHIVE process 90. The data flow from the CREATE TV/RADIO PROGRAMME process represents pre-recorded programme tape, enquiries, rushes and documents together with transmitted programmes. The flow from the archive process 90 represents information and footage. Finally, there is a flow of data from the process ACQUIRE PROGRAMME EVENT RIGHT 92 to the CREATE TV/RADIO PROGRAMME process which represents an insert of programme or broadcast right.

- 21 -

The CREATE TV/RADIO PROGRAMME process 72 is illustrated in more detail in figure 3.

The CREATE TV/RADIO PROGRAMME process 72 may be broken down into 6 sub-processes as follows: RESEARCH AND SUBMIT OFFER 196; PLAN PROGRAMME 198; PREPARE AND RESEARCH 200; CAPTURE MATERIAL 202; MANIPULATE MATERIAL 204; and DELIVER PROGRAMME.

As can be seen from figure 3, these processes involve the flow of data to and from 3 stores: PROGRAMME CONTENT 207; PROGRAMME INFORMATION 210; and PRODUCTION SCHEDULE 212.

Figure 2 shows a STORE 100 which represents the programming schedule. Data flows from the SCHEDULE STORE 100 to the SCHEDULE & PROMOTE PROCESS 86 representing MASTER SCHEDULE data. MASTER SCHEDULE data also flows from the commission output process to the SCHEDULE STORE 100. Data also flows to the SCHEDULE STORE 100 from the SCHEDULE & PROMOTE process 86 representing trail details and confirmed timings and from the play-out and transmit process 84 representing actual start and finish times.

The PROVIDE RESOURCES TO PROGRAMMES process is shown in more detail in figure 28. The process is broken down into six sub-processes: PROVIDE QUOTES & TAKE BOOKINGS 212; SET UP, MONITOR AND MANAGE JOB 214; PROVIDE RESOURCES 216; MANAGE PROJECT FINANCES 218; ESTABLISH COST OF PRODUCTS AND SERVICES 220; and FORECAST DEMANDS OF PRODUCTS AND SERVICES 222.

These sub-processes draw information from and send data to three stores; SCHEDULE & COSTING INFORMATION 224, PROJECT PLAN AND DOCUMENTATION 226 and EXPERIENCE LIBRARY 226.

News within the organisation is represented by 2 processes; CREATE NEWS PROGRAMMES 88 and GATHER NEWS 94. The GATHER

- 22 -

NEWS process receives data flow from 6 external data sources: NEWS EDITORS 96, REGIONAL NEWS 98, NEWSROOM 102, EXTERNAL NEWS PROVIDERS 104, THE PUBLIC/AGENCIES AND WIRES 106 AND EXTERNAL ARCHIVES 108. The data flow from NEWS EDITORS 96 represents guidance, from REGIONAL NEWS 98 and the NEWSROOM represents prospects and also from the NEWSROOM availability, from the EXTERNAL NEWS PROVIDERS 104 represents knowledge of competition, from PUBLIC/AGENCIES AND WIRE 106 represents prospects and diary events and from EXTERNAL ARCHIVE represents information and footage. Data flow is also received from the MANAGE MATERIAL STORE & ARCHIVE process 90 representing information and footage. Data flows from the GATHER NEWS process 94 is to the NEWSROOM 102 representing an assignment, to the EXTERNAL ARCHIVE 108 representing an enquiry, to the MANAGE MATERIAL STORE & ARCHIVE 90 also representing an enquiry and to the CREATE NEWS PROGRAMMES process 88 representing a potential news item and an event, outline or story.

The GATHER NEWS process 94 is illustrated in more detail in figures 4-6 and comprises three sub-processes MAINTAIN DAILY PROSPECTS 110, ALLOCATE RESOURCES 112 and RESEARCH EVENT 114. The RESEARCH EVENT and ALLOCATE RESOURCES processes are illustrated in detail in figures 5 & 6.

The CREATE NEWS PROGRAMMES process 88, in addition to the data flows already described, exchanges data with the EXTERNAL ARCHIVE source 108 by way of enquiries to the archive and information and footage from the archive. Data flow to the MANAGE MATERIAL STORE & ARCHIVE process 90 represents enquiries, rushes and documents, together with pre-recorded programme tape whereas data flow from the MANAGE MATERIAL STORE & ARCHIVE process 90 represents information and footage. Data flow to the SCHEDULE AND PROMOTE process 86 represents promotional material and presentation details and data flow to the PLAY-OUT and TRANSMIT process 84 represents programme feed.

- 23 -

The CREATE NEWS PROGRAMME process is illustrated in more detail in figures 7-9 and comprises 4 sub-processes: SELECT PROGRAMME CONTENT 116, RESEARCH & CAPTURE 118, COMPILE PROGRAMME 120 and EDIT 122. The SELECT PROGRAMME content process is shown in more detail in figure 8 and the RESEARCH AND CAPTURE process is shown in more detail in figure 10. The SELECT PROGRAMME CONTENT process is broken down into four sub-processes: FINALISE NEWS ITEMS 228, ALLOCATE ROUGH TIMINGS 230, ALLOCATE PRODUCTION TEAM 232 and CREATE DRAFT TREATMENT 234. These processes draw a data from a PROSPECTS store 234. The ALLOCATE PRODUCTION TEAM process also draws on available production staff data from a PRODUCTION ROTA store 236.

The COMMISSION OUTPUT process 82, as well as the data flows described with the CREATE TV/RADIO PROGRAMME process 72 receives data from a STORE 124 which represents the controllers stock of untransmitted material. Data is also received from an external entity, representing offers from EXTERNAL PRODUCTION BODIES 126. Data flows from the COMMISSION OUTPUT process to the EXTERNAL PRODUCTION BODY 126 in the form of commissioning briefs, offer responses and production contracts. A second external recipient of data is the CORPORATE CENTRE 128 which receives data relevant to actual versus planned quotas. The COMMISSION OUTPUT process 82 also receives data flow from the SCHEDULE STORE 100 and from a process PLAN OUTPUT SERVICE 130. The data from the STORE represents available slots and the data from the plan output service represents strategic output plan. Data in the form of requirements is sent to the SCHEDULE STORE 100. Data flows from the COMMISSION OUTPUT process to an UNDERSTAND AUDIENCE & COMPETITORS process 132 in the form of information requirements and flows from the UNDERSTAND AUDIENCE & COMPETITORS to the COMMISSION OUTPUT process in the form of filtered statistics.

- 24 -

The COMMISSION OUTPUT process is shown in more detail in figures 10-12 and comprises four processes: DEVISE OUTLINE SCHEDULE 134, EVALUATE AND SELECT OFFICERS 136, NEGOTIATE AND AWARD COMMISSION 138 and CHECK WITH QUOTA TARGETS 140.

5 The ACQUIRE/PROGRAMME EVENT RIGHT 92 process involves data flow between an external source representing the EVENT RIGHT HOLDER 142 with the data representing negotiation and contract and also flow of data in from EXTERNAL EVENT ORGANISERS 144 representing possible events to cover. Data  
10 flows to an EXTERNAL SOURCE 146 representing other distributors. Data representing negotiation and contract flows both ways to and from that source and data to that source represents "ancillary rights which could be sold" and from the source represents "potential acquisitions and  
15 programme and paperwork information".

The ACQUIRE PROGRAMME/EVENT RIGHT process 92 is illustrated in more detail in figure 13. The process 92 is broken down into five sub-processes: IDENTIFY ACQUISITIONS & EVENTS 238, NEGOTIATE & AGREE CONTRACT 240, SELL ANCILLARY RIGHTS 242,  
20 MAINTAIN ACQUIRED STOCK 244 AND ALLOCATE PROGRAMME TO SLOT 246. The sub-processes make use of data in the CONTROLLERS STOCK STORE 124, the SCHEDULE STORE 100 and a RIGHTS STORE 248.

The SCHEDULE AND PROMOTE process 86, in addition to the data  
25 flows already described, receives a flow of data from the UNDERSTAND AUDIENCE & COMPETITORS process representing upheld complaints regarding the content of a broadcast and sends data to the BROADCASTING DATA SERVICES SOURCE 77 representing weekly schedules and data to a recipient  
30 representing press and public relations 148 regarding off-air publicity and promotions. Data flows from the SCHEDULE AND PROMOTE process also to the UNDERSTAND AUDIENCE & COMPETITORS process representing information requirements. Data also flows to the PLAY-OUT & TRANSMIT process

- 25 -

representing on-air publicity and promotions and schedule and continuity script. Data representing a tape list flows to the MANAGE MATERIAL STORE & ARCHIVE process 90.

5 The SCHEDULE AND PROMOTE process is illustrated in more detail in figures 14-16. The SCHEDULE & PROMOTE process is broken down into three sub-processes: CREATE, TRANSMISSION SCHEDULE 250, PLAN & INITIATE ON-AIR PUBLICITY 252 AND PLAN & INITIATE OFF-AIR PUBLICITY 254. Each of these processes relies on data flow to and from the SCHEDULE STORE 100. The  
10 CREATE TRANSMISSION SCHEDULE process is shown in more detail in figure 16 and the PLAN & INITIATE ON-AIR PUBLICITY process is shown in more detail in figure 16.

15 The PLAY-OUT AND TRANSMIT process 84, in addition to the data flows described already sends information requirements to the UNDERSTAND AUDIENCE & COMPETITORS process 132, transmitted programme data, transmission log and original documents to the MANAGE MATERIAL STORE & ARCHIVE process 90. Pre-recorded tape information is received from the MANAGE MATERIAL STORE & ARCHIVE process and completed contract  
20 information flows to a MANAGE RIGHTS AGENCY process 150. Distribution data flows to, and transmission service data flows from an External source/recipient labelled DISTRIBUTION SERVICE PROVIDER 152.

25 The PLAY-OUT AND TRANSMIT process is illustrated in more detail in figures 17 & 18. The PLAY-OUT & TRANSMIT process comprises 4 sub-processes: PERFORM PLAY-OUT 256, CAPTURE ACTUAL TRANSMISSION DETAILS 258, INITIATE POST-TRANSMISSION RIGHTS PAYMENT 260 and PERFORM PROMOS ANALYSIS 262. These processes draw on data from the SCHEDULE 100 and from a  
30 store of research statistics 264. The PERFORM PLAY-OUT sub-process is shown in more detail in figure 18.

The MANAGE MATERIAL STORE & ARCHIVE process 90, in addition to the data flows described already receives a data flow

- 26 -

from the UNDERSTAND AUDIENCE & COMPETITORS process 132 in the form of request for tapes and sends data to that process in the form of pre-recorded programme tapes. Data flow from two external sources, EXTERNAL ARCHIVE 154 and ARCHIVE STEERING GROUP 156 represent material and rights flowing from outside the Organisation and strategic direction respectively.

The MANAGE MATERIAL STORE & ARCHIVE process is illustrated in more detail in figures 19-21. The MANAGE MATERIAL STORE & ARCHIVE process may be broken down into three sub-processes as shown in figure 19. These processes are CREATE ARCHIVING POLICY 266, MANAGE INCOMING MATERIAL 268 and RETRIEVE MATERIAL 270. The latter two sub-processes draw on data in a MATERIAL STORE & ARCHIVE 272. The MANAGE INCOMING MATERIAL sub-process is shown in more detail in figure 20 and the RETRIEVE MATERIAL sub-process is shown in more detail in figure 21.

The MANAGE RIGHTS AGENCY process 150 will receive data flow representing Union & Framework Agreements from a source representing Union & Industry Bodies 156 and data will flow to a recipient representing Worldwide product Licences 158. The MANAGE RIGHTS AGENCY process is illustrated in more detail in figure 22.

The PLAN OUTPUT service process 130 receives data flows from external sources representing the chief executive broadcast 160, the Government 162 and any relevant legislation represented here by the Broadcasting Act 1990, 164. Data also flows from the UNDERSTAND AUDIENCE & COMPETITORS process in the form of filtered statistics. Data is output to the SCHEDULE 100 in the form of news slots, to the COMMISSION OUTPUT process 82 in the form of strategic output plans and to the CREATE NEWS PROGRAMMES process 88 in the form of guaranteed news output. The plan output service is illustrated in more detail in figure 23.

- 27 -

The UNDERSTAND AUDIENCE & COMPETITORS process gathers information from a variety of external sources such as the Government 162 in the form of broadcasting requirements, for example under a broadcasting charter, from broadcasting industry monitoring services in the form of viewer/listener statistics, quote requests and contracts and other research results, from viewers and listeners in the form of complaints and feedback. Information flows to external sources in the form of published statistics to an annual report, reports and statistics to a given channel controller, responses to viewers and listeners and requests to statistical gathering agencies. The UNDERSTAND AUDIENCE & COMPETITORS process is illustrated in more detail in figures 24-27. The UNDERSTAND AUDIENCE & COMPETITORS process can be broken down into two sub-processes: MANAGE RESEARCH STATISTICS 274 and HANDLE AUDIENCE FEEDBACK 276. These sub-processes are shown in more detail in figures 25 & 26 respectively. Figure 26 shows that the HANDLE AUDIENCE FEEDBACK sub-process can be further sub-divided into two more sub-processes: DEAL WITH AUDIENCE FEEDBACK 278 and INVESTIGATE COMPLAINTS 280. The DEAL WITH AUDIENCE FEEDBACK sub-process is further illustrated in figure 27.

A combination of the data model of figures 1a) to c) and the PROCESS flow diagram of figure 2 can be used to develop a standard media exchange framework. This sets out the metadata items which must be associated with media material, concepts or services at each level of the entity model and can be used to define the exchange at each process interface.

An example of a possible exchange framework interface is the data which is required to be created by or loaded into a capture device such as a camera. This requires standardisation amongst camera manufacturers. Some of that information might then be imported into the device from a data store before capture, to be embedded with a media

- 28 -

material as it is created, then it and new data subsequently exported into an information system for media management purposes, or for access by an editing system for onward processing. Rather than capture the data at the end of a process, data is captured as it happens and is perpetuated.

The media exchange architecture described enables the linking of media materials together with their metadata in a way which enables extremely efficient development, re-use and re-purposing of media in an integrated but distributed device and database.

Application of the data structure described enables systems to be built which will integrate converging requirements of broadcast and media business systems. Systems which are compliant with this structure will be easier to integrate as the data exchange standard will be consistent regardless of the internal storage schemes used. Systems which are compliant in their internal storage schemes will also be optimumly efficient in their use of storage. Specific examples of systems which can be made compliant include media commissioning and scheduling systems, systems to support content production process, broadcast play-out systems, Internet websites, customer feedback capture systems, content asset management systems, intellectual property right systems and archive systems.

The data structure is typically implemented in software, for example the data dictionary may be held in a software repository.

**CLAIMS**

1. A method for defining a metadata structure relating to media materials, concepts and services, the method comprising the steps of:

- 5 defining a plurality of storage entities at a plurality of levels for metadata relating to media materials, concepts and services, the storage entities having a plurality of storage elements and being related with a media metadata subject grouping, and arranged in hierarchical and non-hierarchical relationships allowing an appropriate combination of elements as required;

- 10 storing metadata relating to a given storage entity in one of a plurality of storage elements of the entity at that level, each storage element representing an attribute or characteristic of the entity subject or media material;

- 15 arranging media metadata entities and attributes relating directly to the media material, concepts and services in hierarchical and non-hierarchical entity level relationships allowing an appropriate combination of elements are required; and

- 20 wherein for hierarchical entities, the storage elements of storage entities at a level apart from the lowest level, comprise the storage elements of the immediately lower storage level.

- 25 2. A method according to claim 1, wherein the storage entities include an editorial object concept entity which may give rise to one or more editorial object version entities, wherein the metadata stored within the editorial object concept entity is related to the editorial object version entity, the version entity comprising the
- 30 immediately lower storage level.

- 30 -

3. A method according to claim 2, wherein the storage entities include a programme version level and an item version level; the programme version level and the item version level being subtypes of the editorial object version.

4. A method according to claim 3, wherein the storage entities include a media object level, and the programme version and item version entities are related to media object metadata, the media objects comprising the immediate lower level.

5. A method according to claim 4, wherein the media object level includes occurrences of individual media types as sub types.

6. A method according to claim 5, wherein the media object includes an audio level subtype and the storage elements relate to audio metadata.

7. A method according to claim 5, wherein the media object level includes a text level sub-type and the metadata storage elements relate to text metadata.

8. A method according to claim 5, wherein the media object level includes a graphics level subtype and the media object level storage elements relate to graphics metadata.

9. A method according to claim 5, wherein the media object level includes a stills level subtype and the media object level storage elements relate to stills metadata.

10. A method according to claim 1, further comprising storing the entity and attribute definitions as a metadata dictionary, wherein metadata occurrences are defined to be consistent with the metadata dictionary.

- 31 -

11. A method according to Claim 10, wherein the dictionary further includes acceptable synonyms for at least some of the metadata.

12. A method according to claim 1 further comprising  
5 defining a plurality of levels of business stores each comprising business elements each relating to business metadata, the business stores being linked to the metadata stores at a storage level dependent on the business element metadata.

13. A method according to claim 12, wherein one of the plurality of levels of business stores comprises a rights level comprising one or more related entities containing  
10 business metadata identifying legal rights attached to the media material, the business metadata including the legal jurisdiction of the right, the geographical territory of the right, the duration of the right and the owner of the right.

14. A method according to claim 1 wherein the media material is a radio, television or Internet material or  
15 associated or derived product.

15. A method according to claim 1, wherein the storage levels cover the distributed media supply chain extending  
20 from service proposition to audience consumption.

16. A method according to claim 1, comprising defining a plurality of mutually consistent hierarchies of storage  
25 levels.

17. A method of defining a standard media exchange framework comprising the steps of:

defining a media metadata structure according to the method of claim 1,

30 defining a process flow model reflecting the media production and distribution chain; and

- 32 -

defining metadata items for exchange between one process in the media production and distribution chain and another.

18. A data structure for defining broadcast media metadata comprising:

a plurality of storage entities for metadata relating to media materials, concepts and services, the entities being arranged in storage levels and each entity comprising a plurality of storage elements each for storing metadata relating to a given entity, each storage element representing an attribute or characteristic of the entity subject or the media material;

wherein the storage levels are hierarchical and non-hierarchical allowing the appropriate combination of elements as required, where the levels are hierarchical, the storage elements of storage entities, apart from the lowest level, comprise the stores of the immediately lower storage level.

19. A structure according to claim 18, wherein the storage entities include an editorial object concept entity which may give rise to one or more editorial object version entities, wherein the metadata stored within the editorial object concept entity is related to the editorial object version entity, the editorial object version entity comprising the immediately lower storage level.

20. A structure according to claim 19, wherein the storage entities include an item version level and a programme version level, each of the item version level and the programme version level being subtypes of the editorial objection version entity.

21. A structure according to claim 20, wherein the programme version and item version entities relate to media

- 33 -

object metadata, the media objects comprising the immediately lower level.

22. A structure according to claim 21, wherein the media object level includes occurrences of individual media types as subtypes.

23. A structure according to claim 22, wherein the media object level includes an audio level subtype and the storage elements relate to audio metadata.

24. A structure according to claim 22, wherein the media object level includes a text level subtype and the storage elements relate to text metadata.

25. A structure according to claim 22, wherein the media object level includes a graphics level and the storage elements relate to graphics metadata.

26. A structure according to claim 22, wherein the media object level includes a stills level and the media object level storage elements relate to stills metadata.

27. A structure according to claim 18, further comprising a metadata dictionary having stored therein entity and attribute definitions, wherein the metadata occurrences are defined to be consistent with the metadata dictionary.

28. A structure according to claim 27, wherein the dictionary further includes acceptable synonyms for at least some of the metadata.

29. A structure according to any of claims 18 to 28 comprising entities relating to editorial requirements and entities relating to instantiation requirements.

- 34 -

30. A structure according to claim 18 further comprising a plurality of levels of business entities each comprising storage elements related to business metadata, the business elements being linked to the media metadata entities at a storage level dependent on the business element metadata.

31. A structure according to claim 30, wherein one of the plurality of levels of business storage elements comprises a rights level and includes one or more entities containing business metadata identifying legal rights attached to the media material, the business metadata including the legal jurisdiction of the right, the geographical territory of the right, the duration of the right and the owner of the right.

32. A structure according to claim 18 wherein the media material is a radio, television or Internet material or associated or derived product.

33. A structure according to claim 18, wherein the storage levels cover the broadcast media supply chain extending from service proposition to audience consumption.

34. A structure according to claim 18, including a plurality of mutually consistent hierarchies of storage levels.

35. A data structure for defining media metadata comprising:

a plurality of storage entities for metadata relating to media production and distribution, the entities being arranged at storage levels and each entity comprising a plurality of storage elements each holding metadata relating to a given entity level, each storage element representing an attribute or characteristic of the entity subject or the media material;

a plurality of levels of business entities each comprising storage elements storing business metadata, the

- 35 -

business entities being linked to the metadata stores at a storage level dependent on the business element metadata, one of the plurality of levels of business stores comprising a rights level and having one or more storage entities containing business metadata identifying legal rights attached to the media material, the business metadata including the legal jurisdiction of the right, the geographical territory of the right, the duration of the right and the owner of the right;

wherein the metadata storage levels are hierarchical and non-hierarchical and, for hierarchical storage levels, the metadata stored in the storage elements of storage entities at a level, apart from the lowest level comprise the stores of the immediately lower storage level.

36. A data structure for defining media metadata comprising:

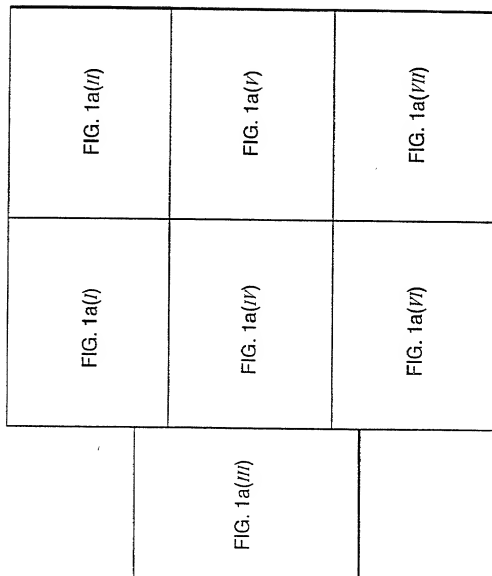
a plurality of storage entities for metadata relating to media production and distribution, the entities being arranged at storage levels and each entity comprising a plurality of storage elements each holding metadata relating to a given entity level, each storage element representing an attribute or characteristic of the entity subject or the media material;

a rights store linked to at least one of the metadata stores and comprising one or more storage entities containing business metadata identifying legal rights attached to the media material, the business metadata including the legal jurisdiction of the right, the geographical territory of the right, the duration of the right and the owner of the right;

wherein the metadata storage levels are hierarchical and non-hierarchical and, for hierarchical storage levels, the metadata stored in the storage elements of storage entities at a level, apart from the lowest level, comprise the stores of the immediately lower storage level.

1/77

FIG. 1a



2/77

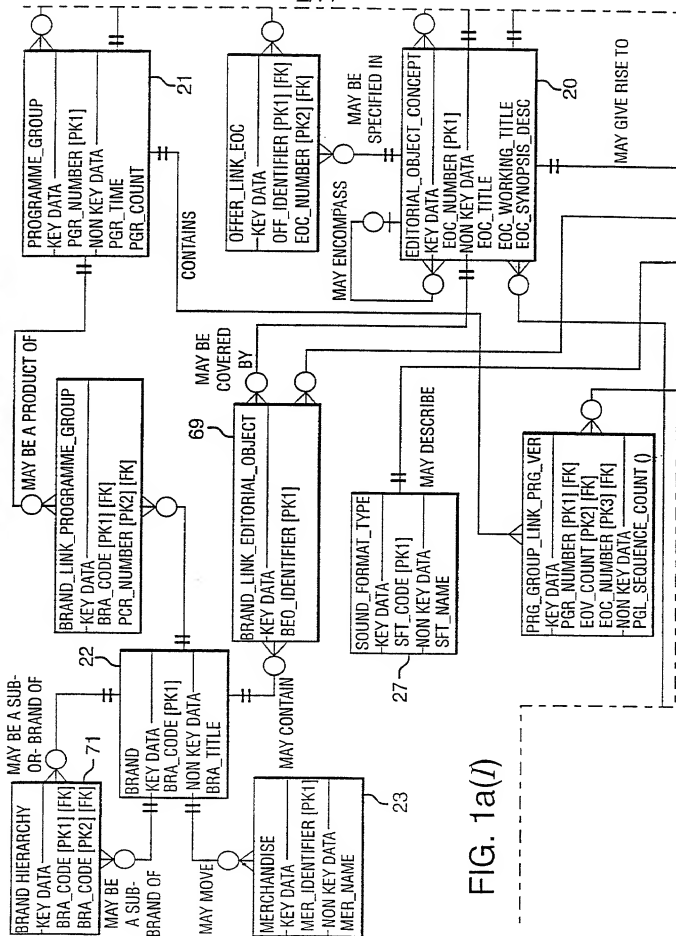
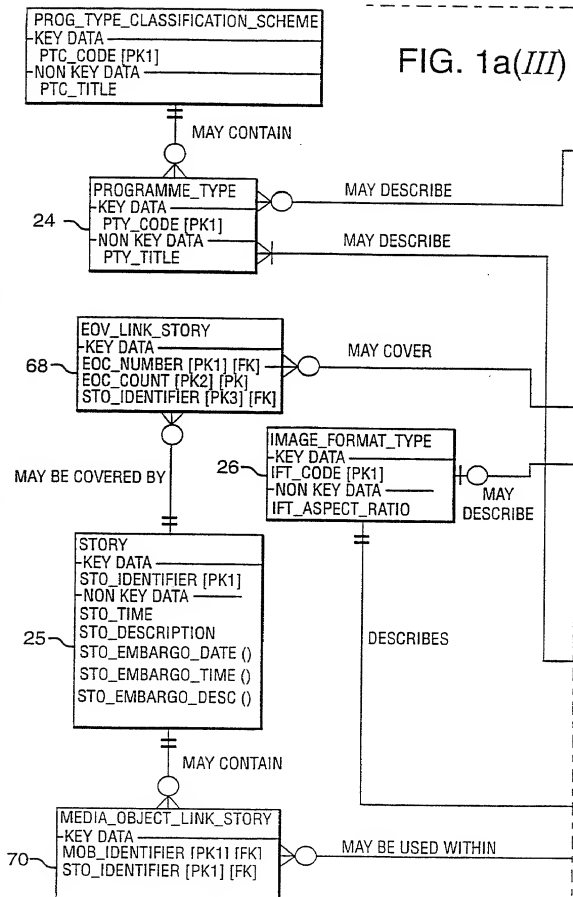


FIG. 1a(i)



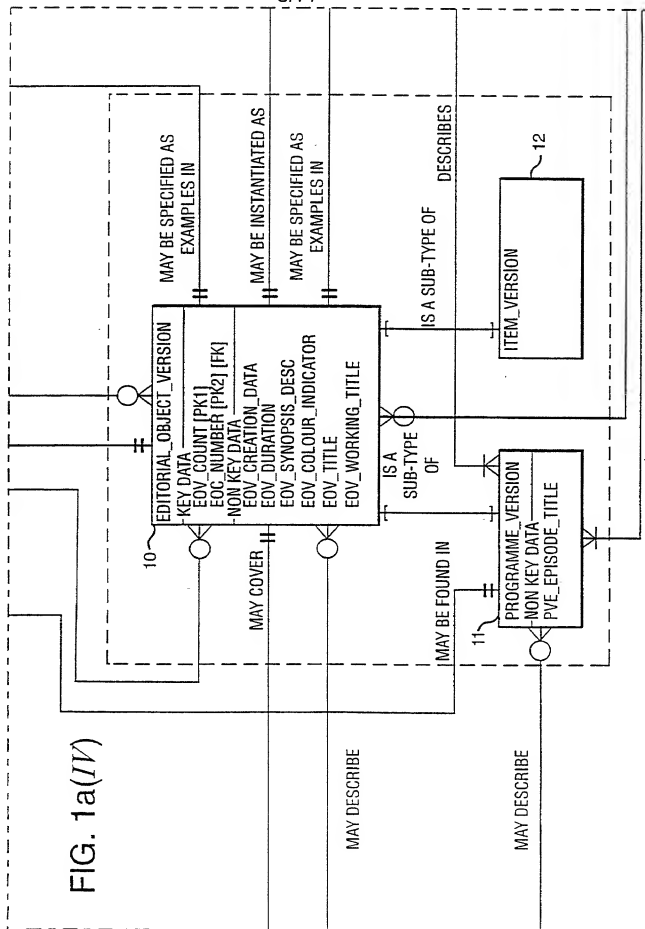
4/77

FIG. 1a(III)



5/77

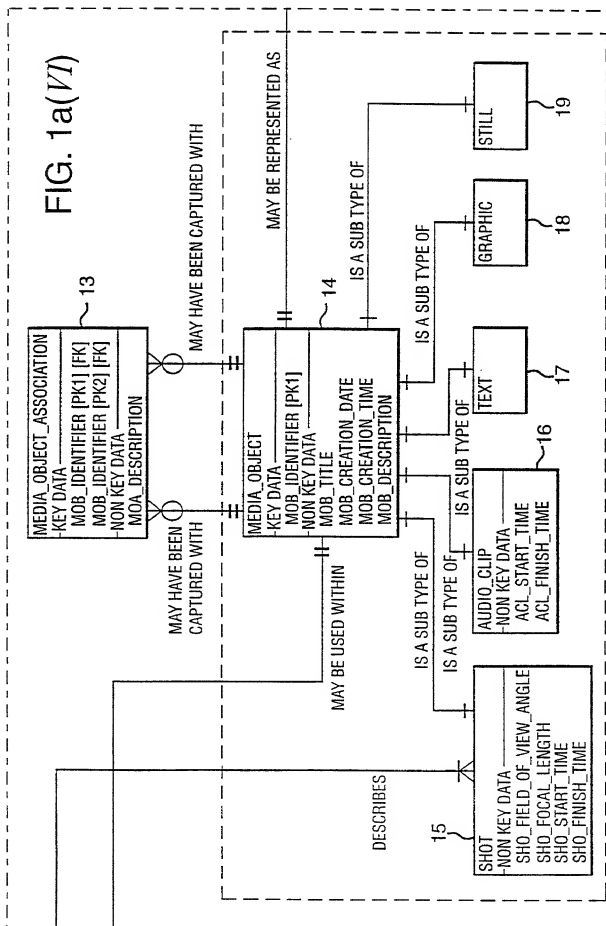
FIG. 1a(IV)

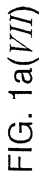




7/77

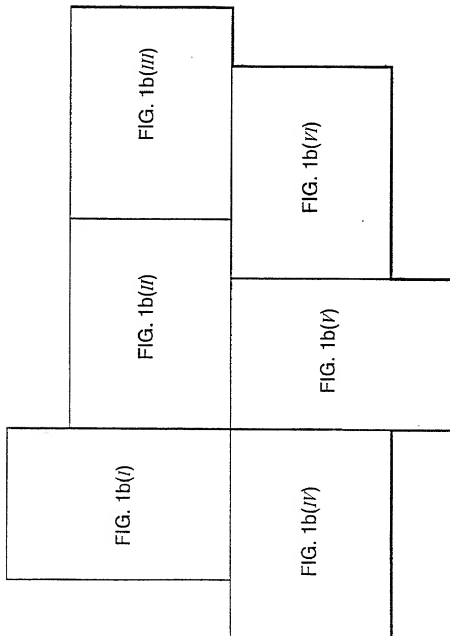
FIG. 1a(VI)





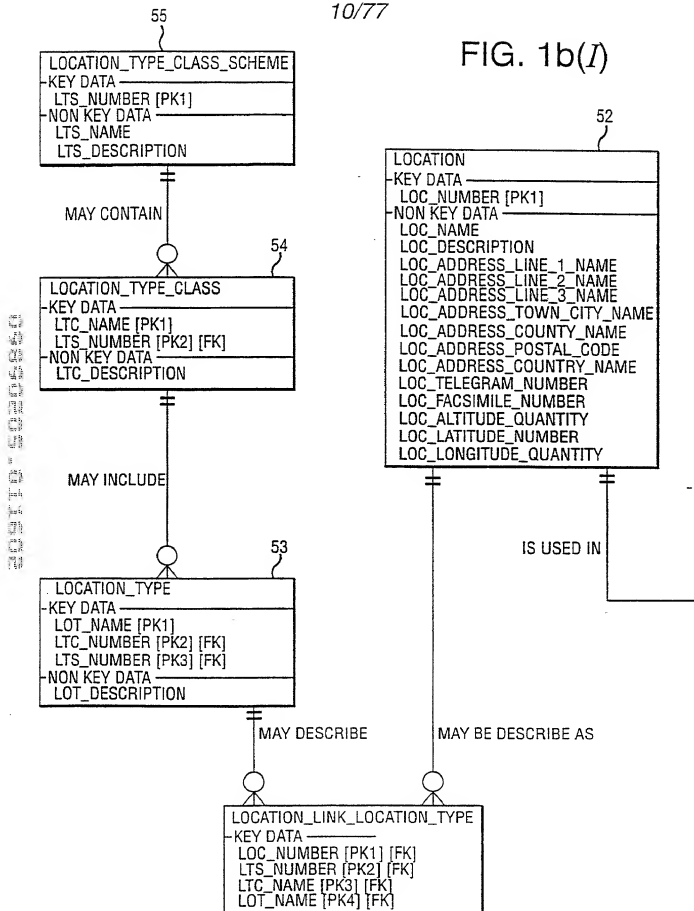
9/77

FIG. 1b



10/77

FIG. 1b(I)



11/77

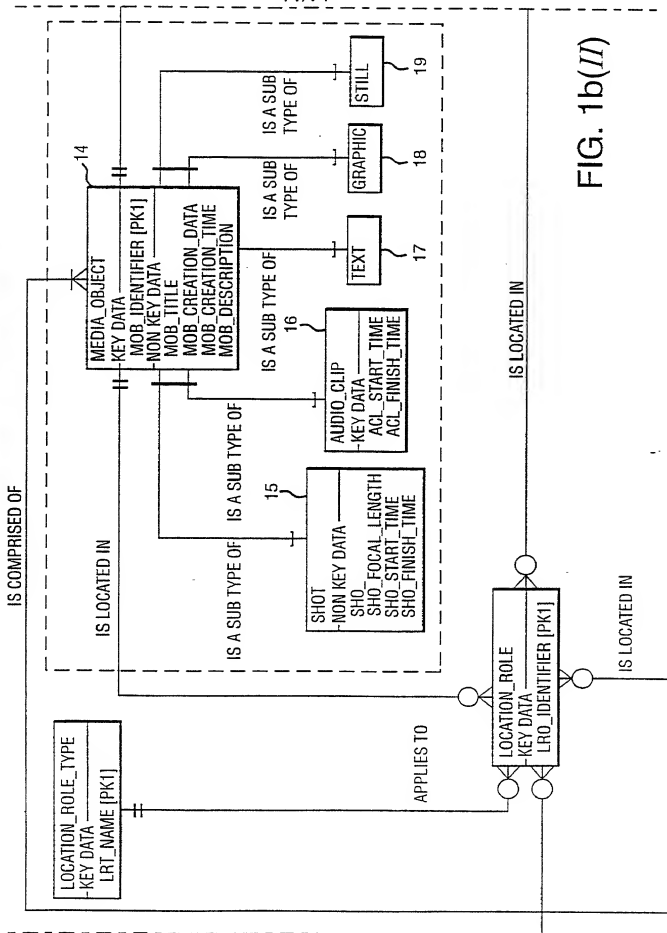
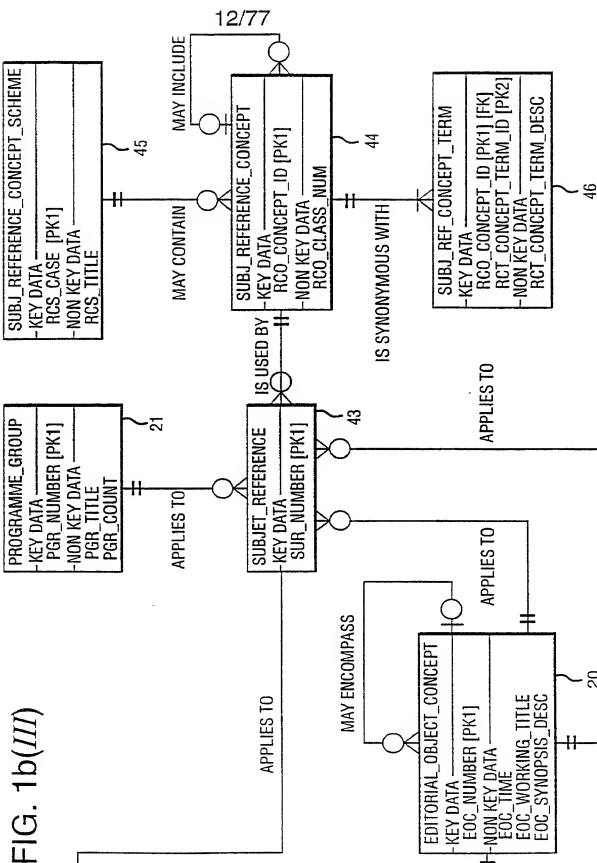
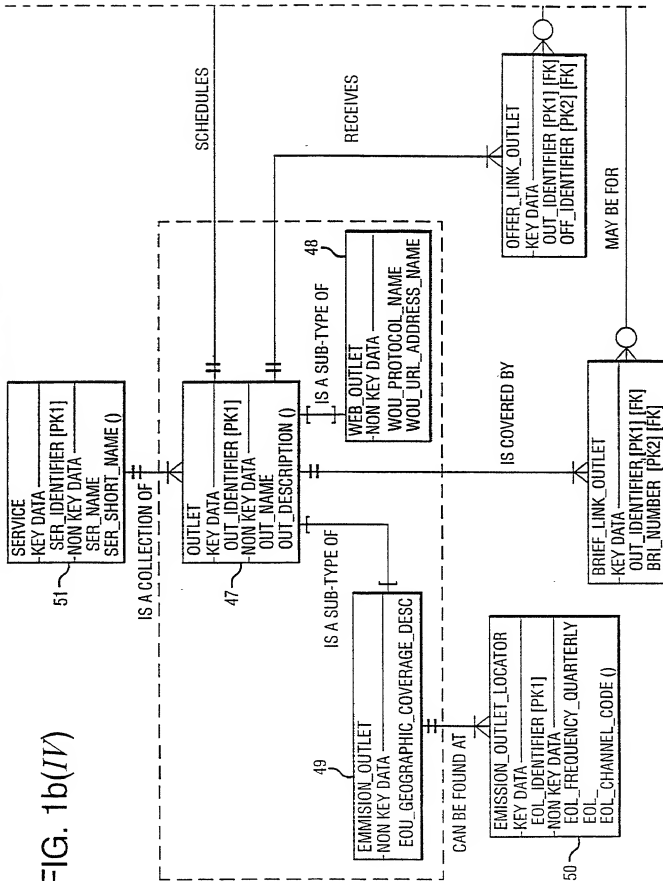


FIG. 1b(II)

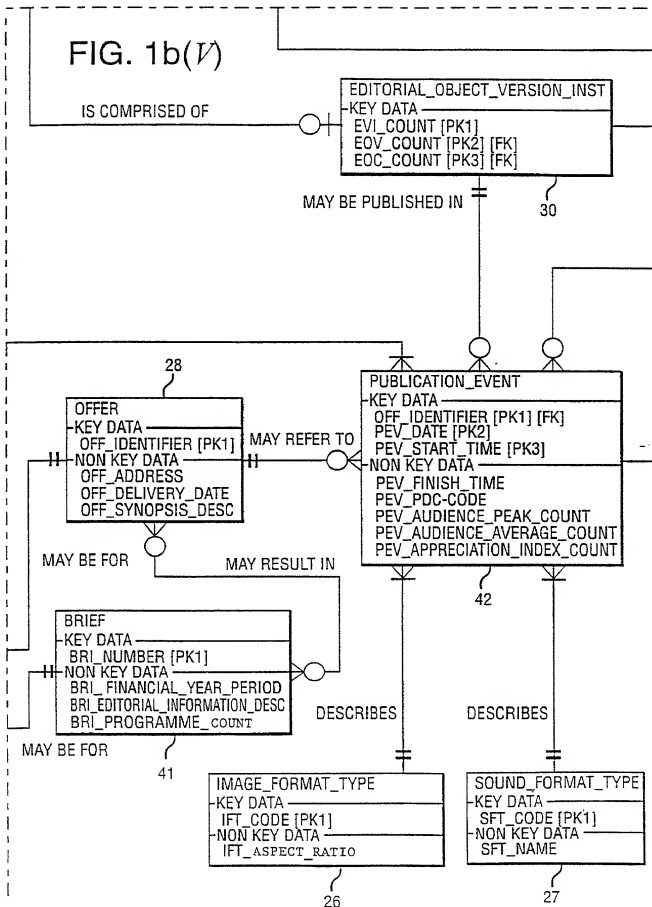


13/77

FIG. 1b(IV)



14/77



15/77

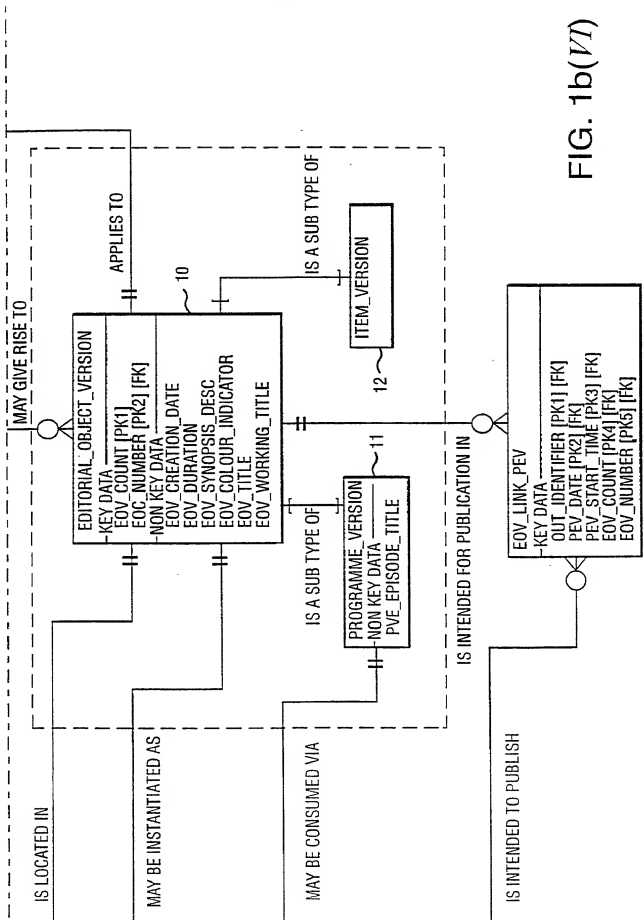
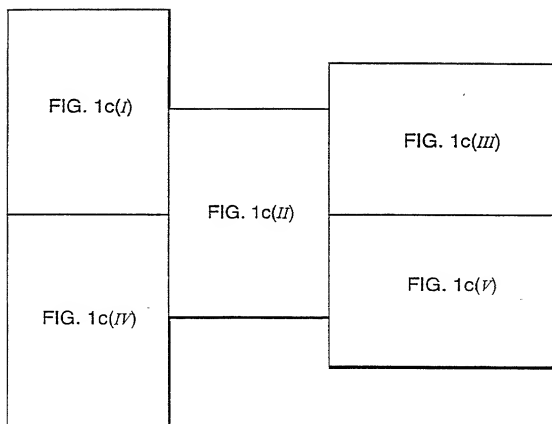


FIG. 1b(11)

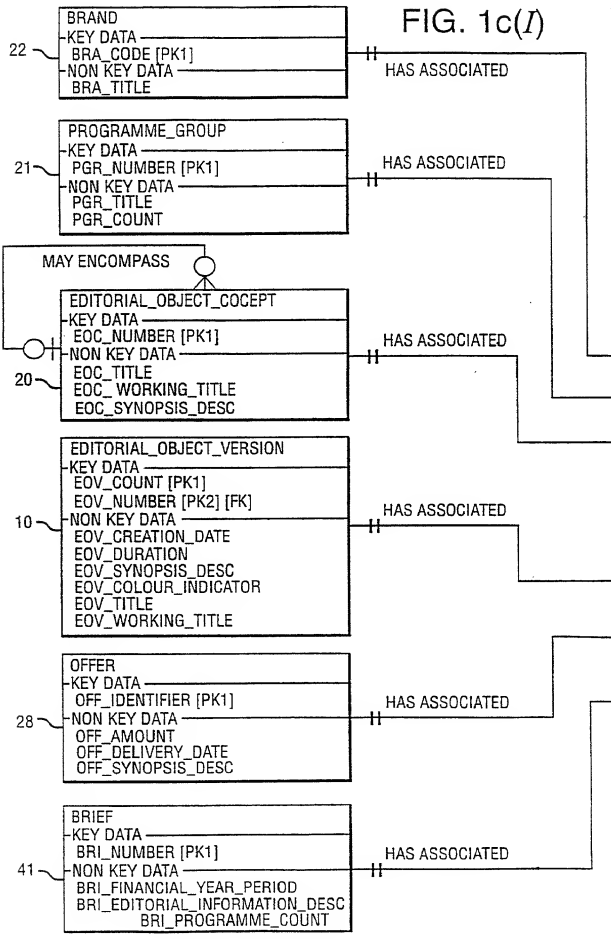
16/77

FIG. 1c



17/77

FIG. 1c(I)



18/77

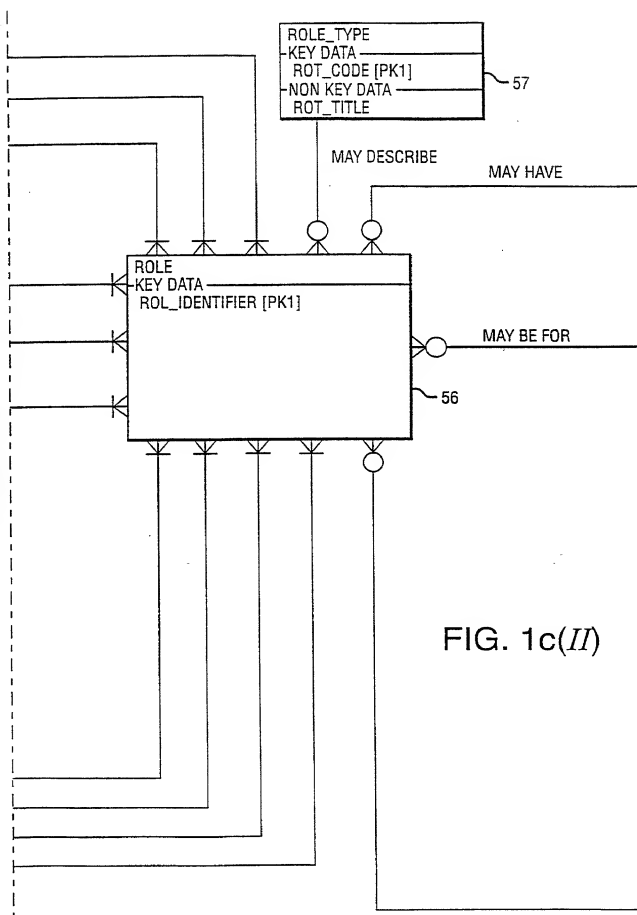
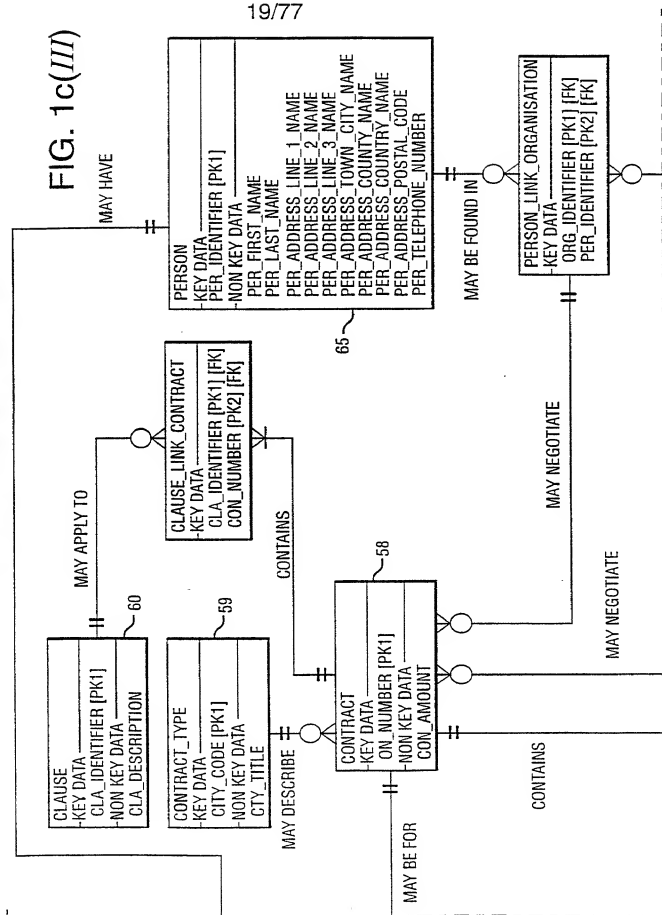


FIG. 1c(II)

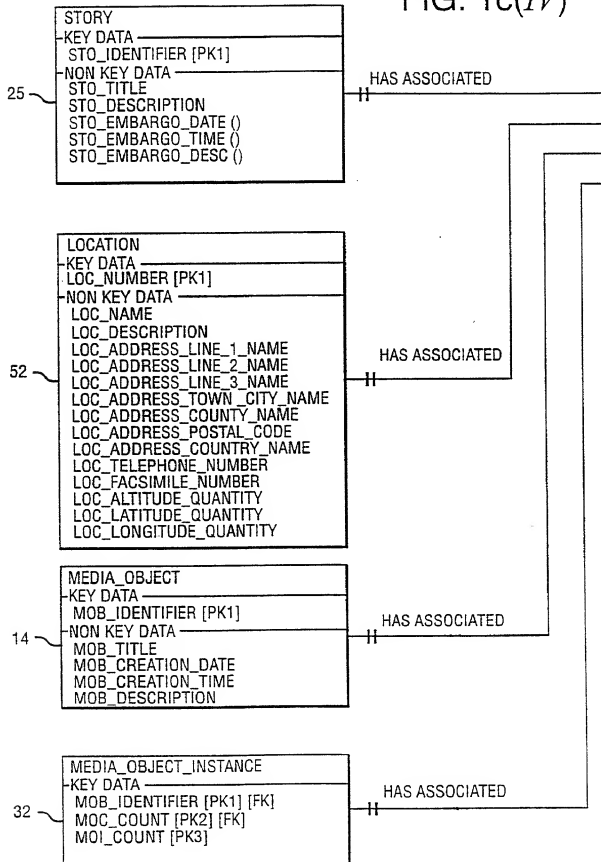
19/77

FIG. 1c(III)



20/77

FIG. 1c(IV)



21/77

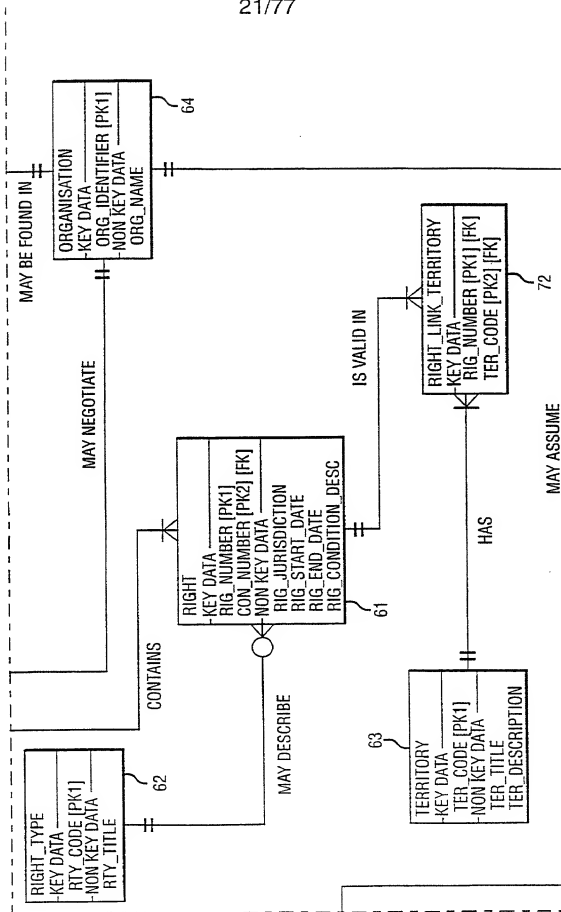


FIG. 1c(V)

22/77

FIG. 2(i)	FIG. 2(ii)	FIG. 2(iii)	FIG. 2(iv)	FIG. 2(v)	FIG. 2(vi)
FIG. 2(vii)	FIG. 2(viii)	FIG. 2(ix)	FIG. 2(x)	FIG. 2(xi)	FIG. 2(xii)

FIG. 2

FIG. 2(I)

23/77

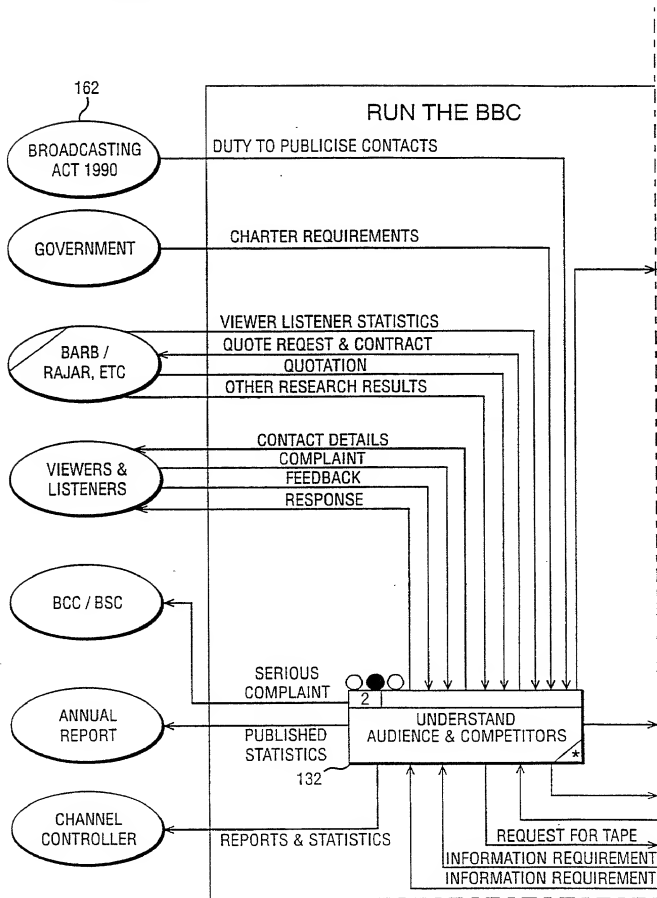
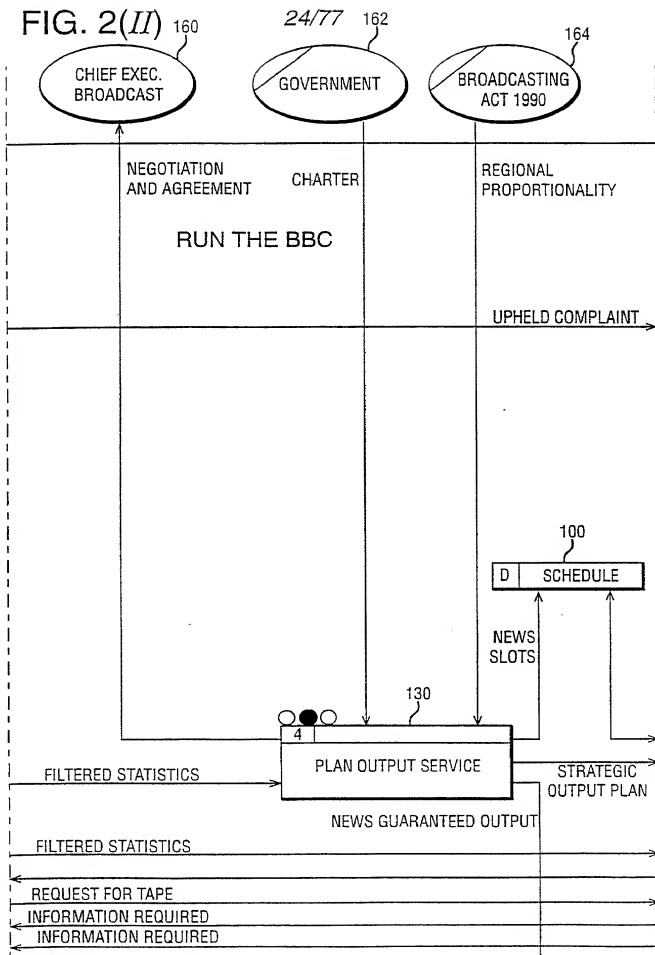


FIG. 2(II)



25/77

FIG. 2(III)

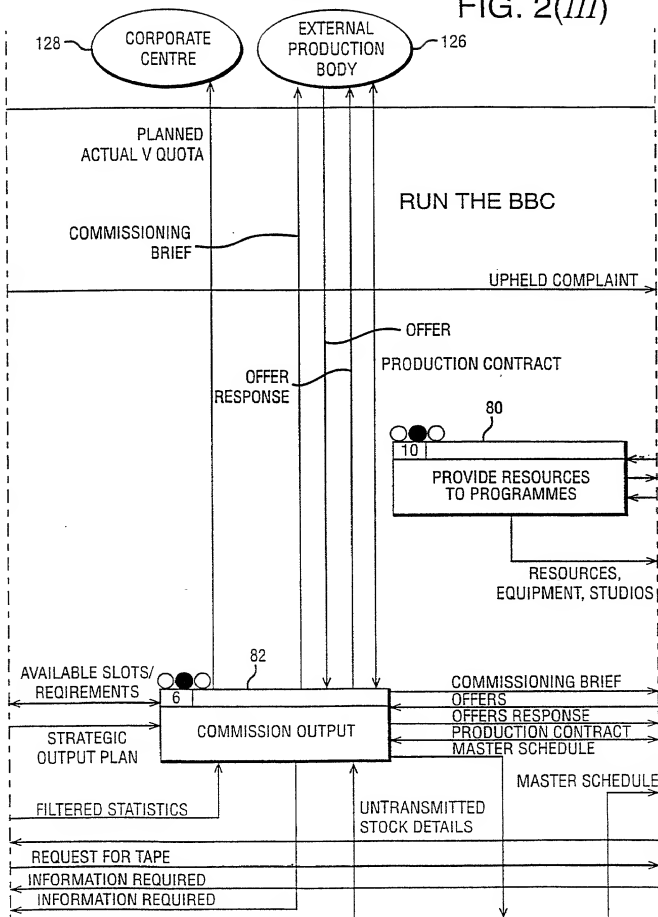


FIG. 2(IV)

26/77

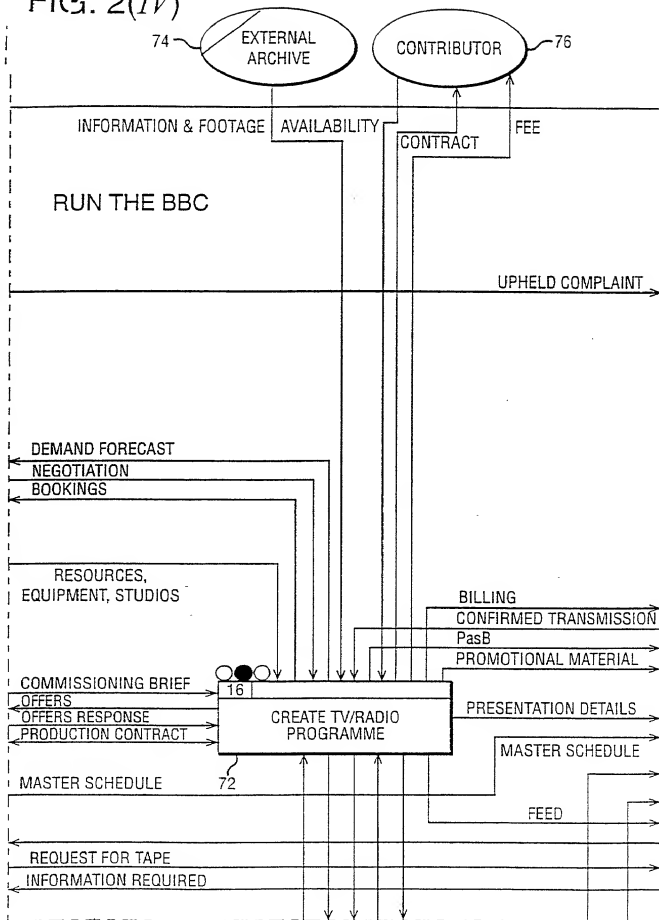
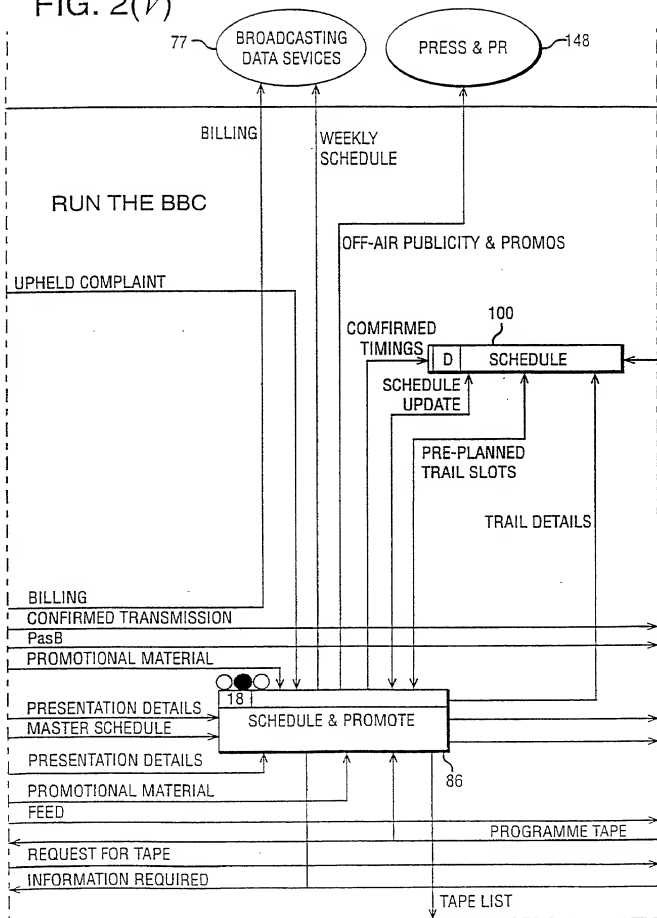


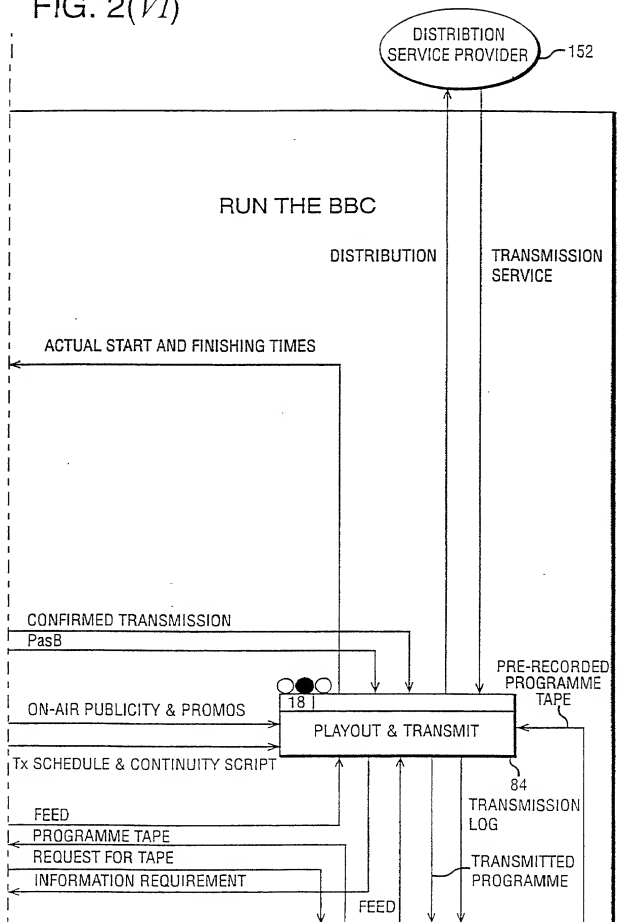
FIG. 2(V)

27/77



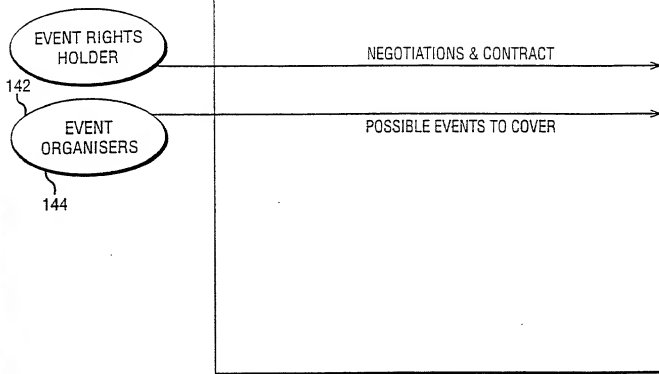
28/77

FIG. 2(VI)



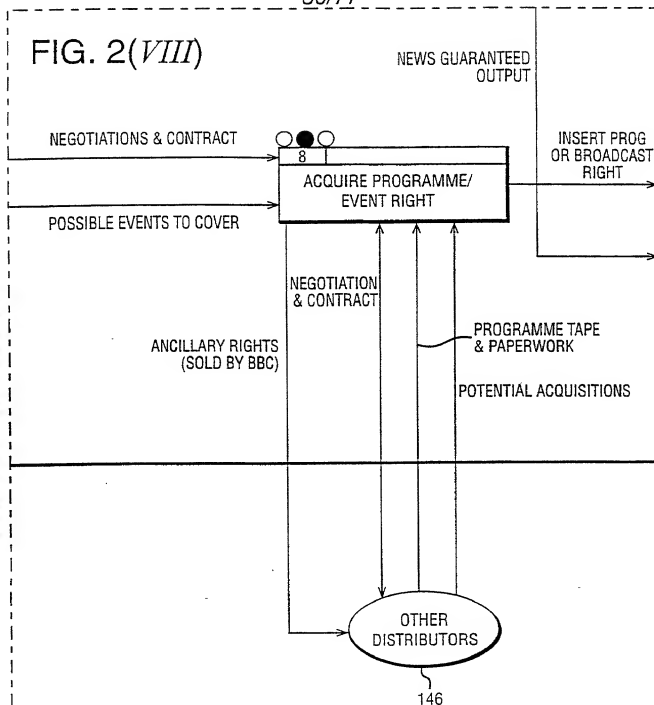
29/77

FIG. 2(VII)

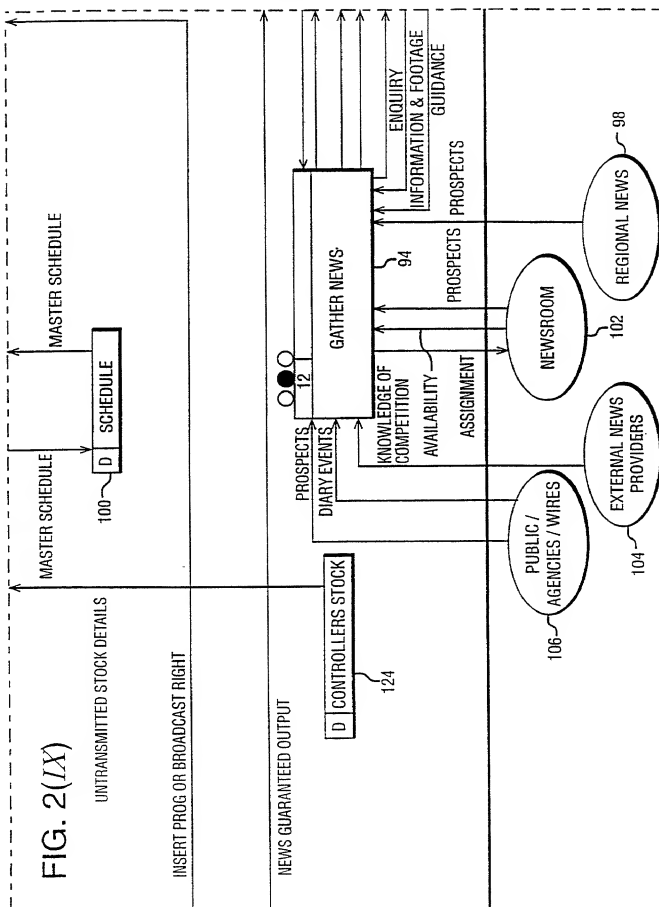


30/77

FIG. 2(VIII)



31/77



32/77

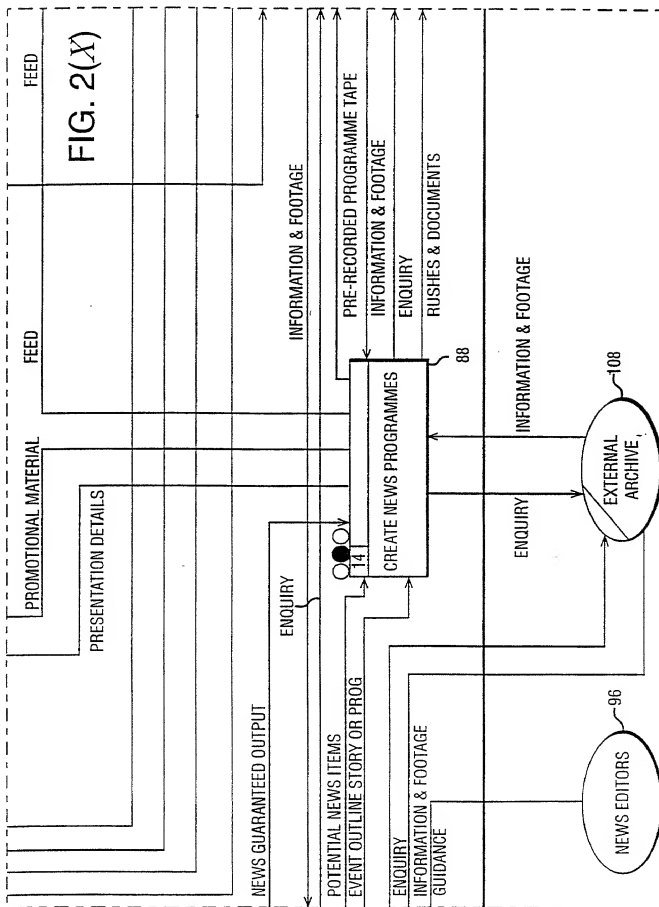


FIG. 2(XI)

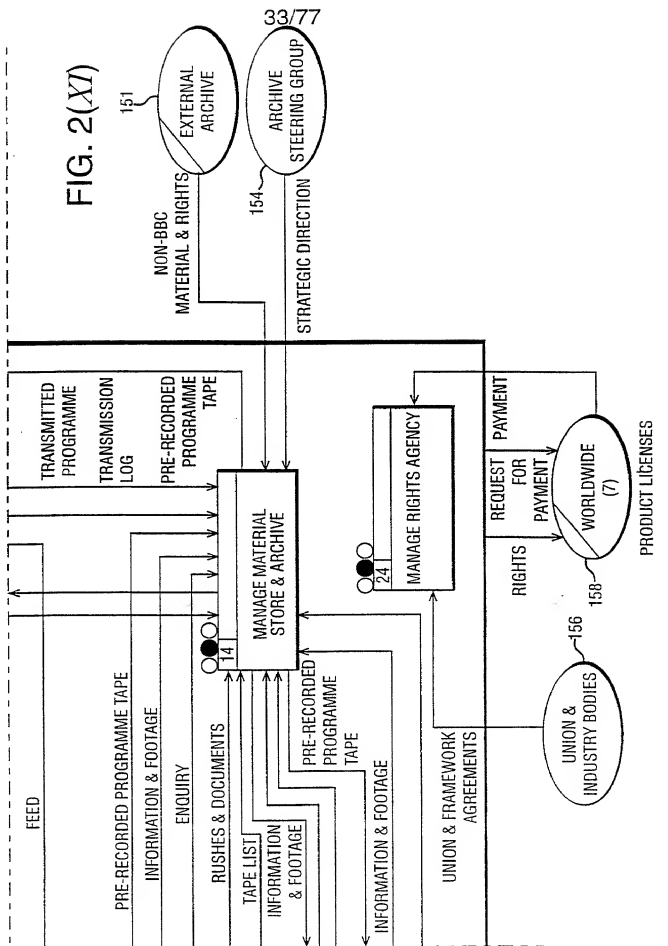
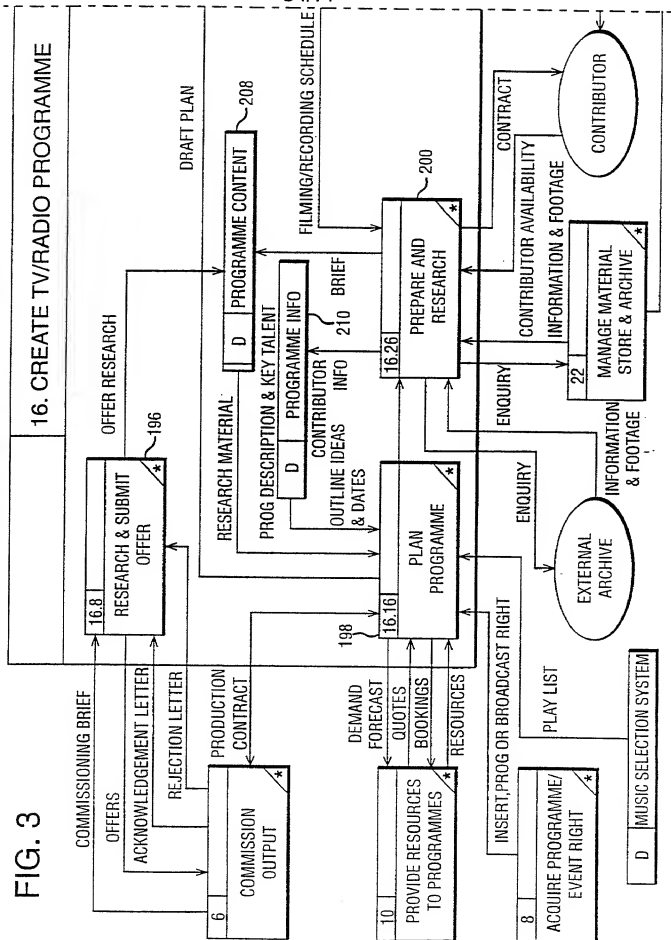
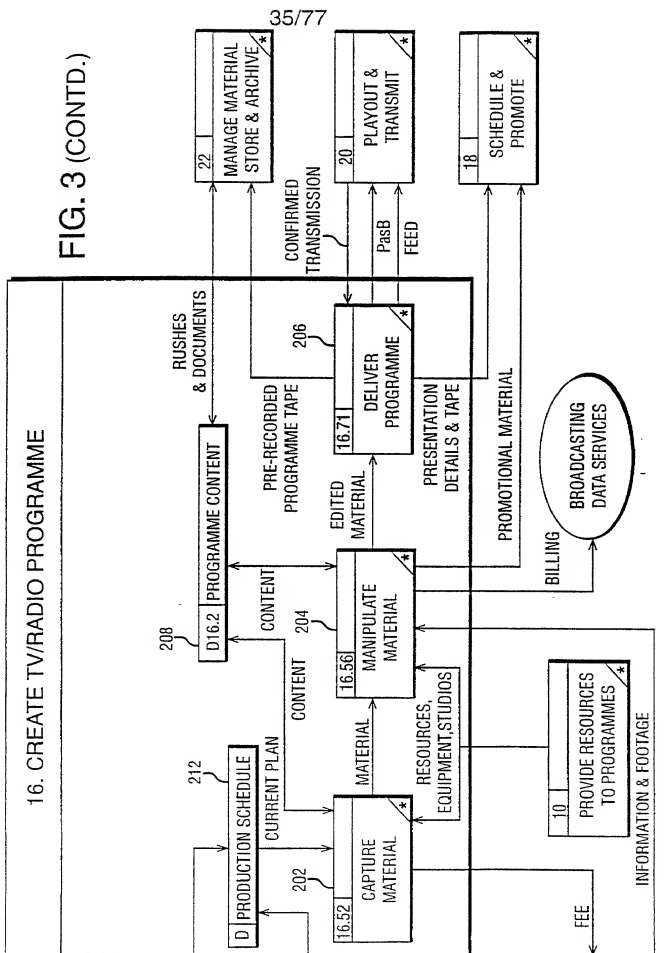


FIG. 3



## 16. CREATE TV/RADIO PROGRAMME



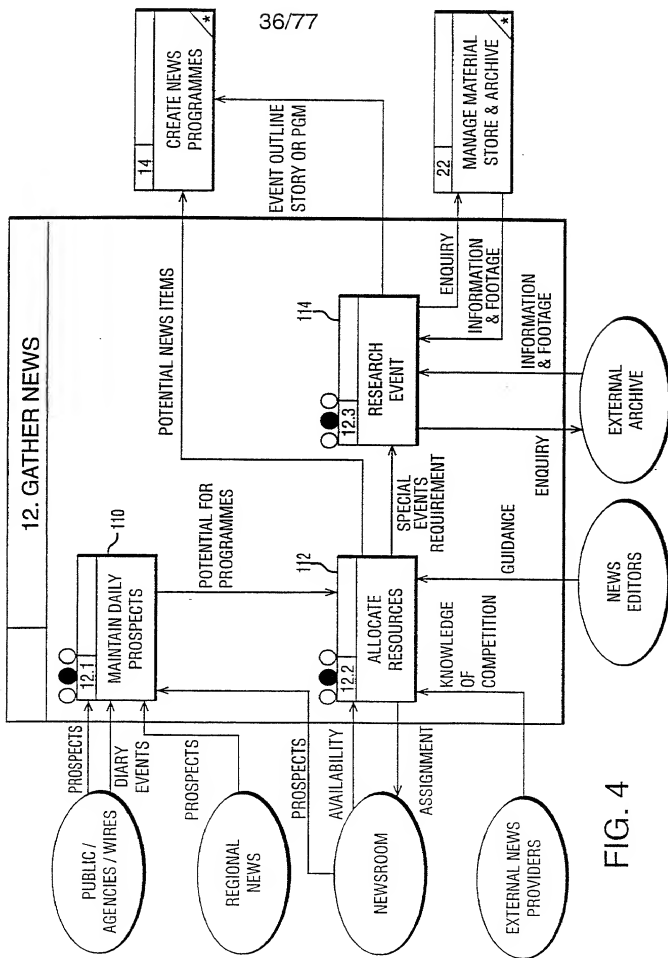
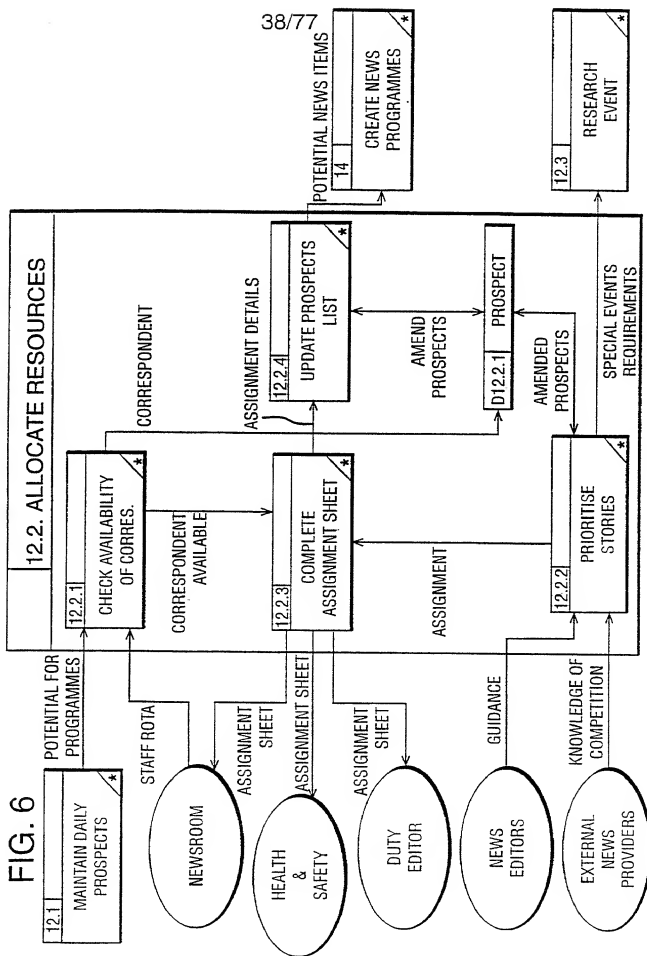


FIG. 4

FIG. 5





[illegible]

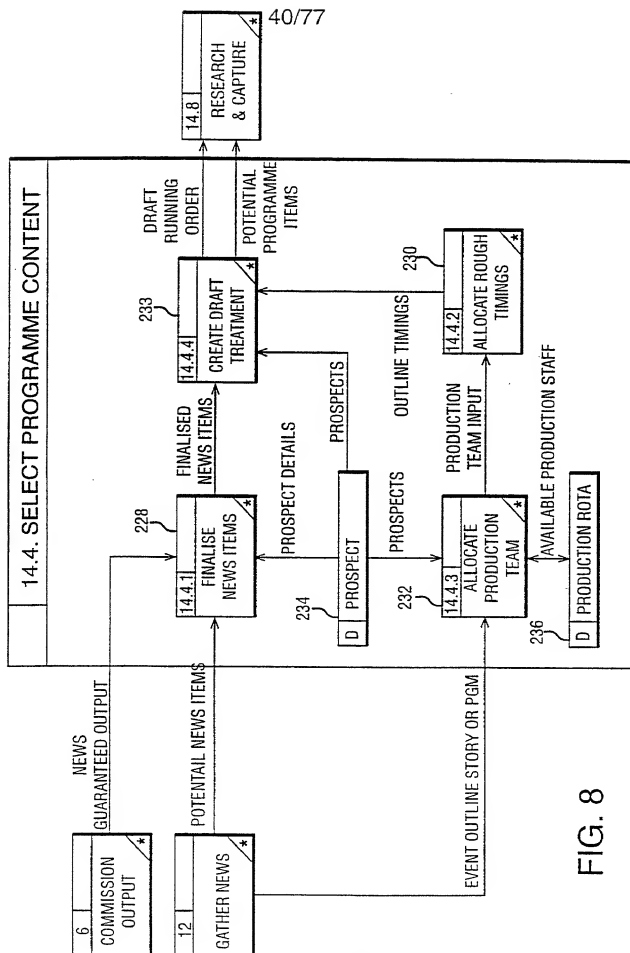
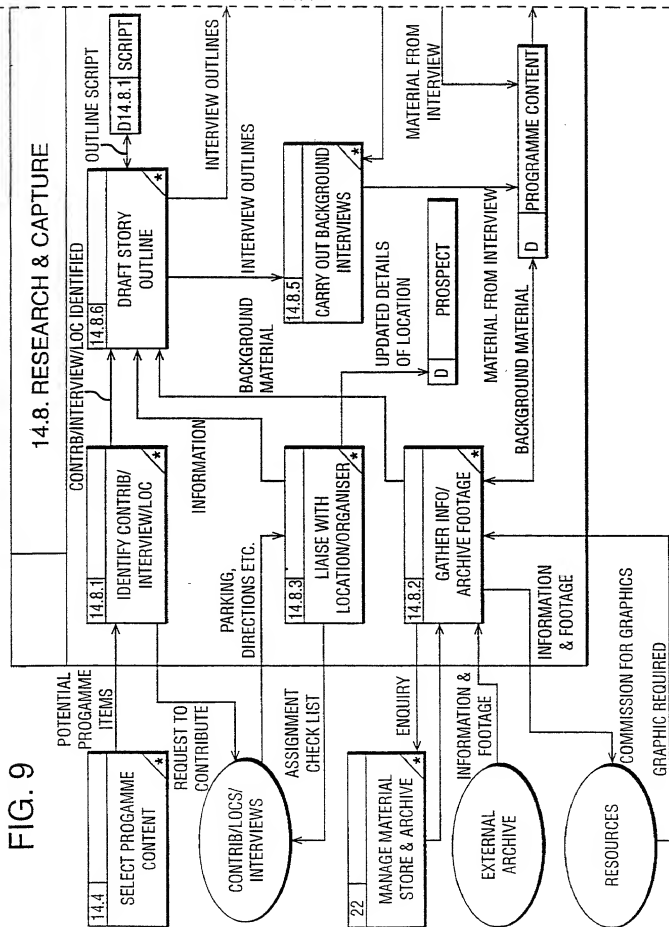


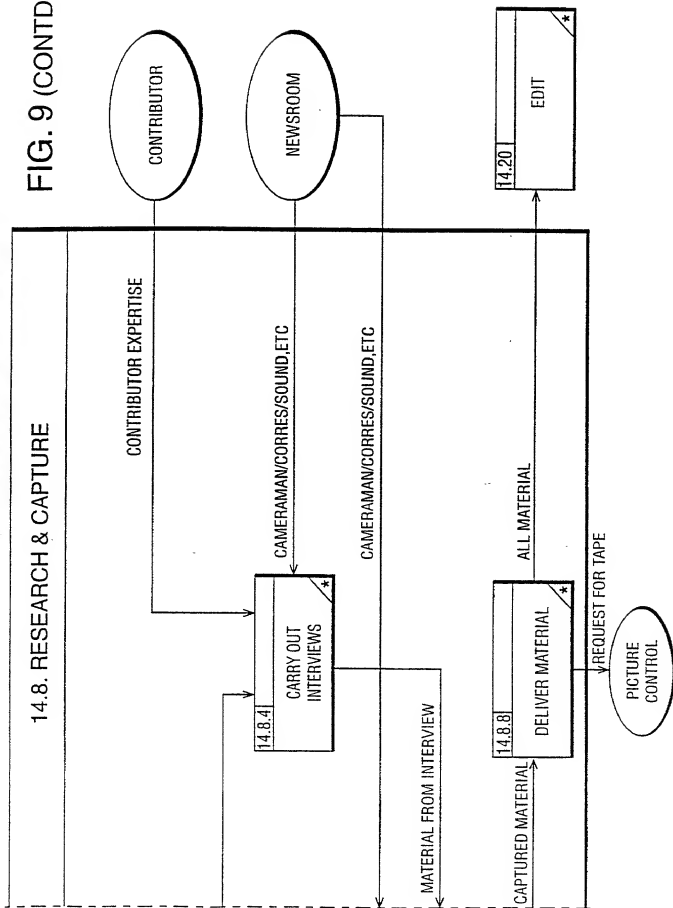
FIG. 8

41/77



42/77

FIG. 9 (CONTD.)

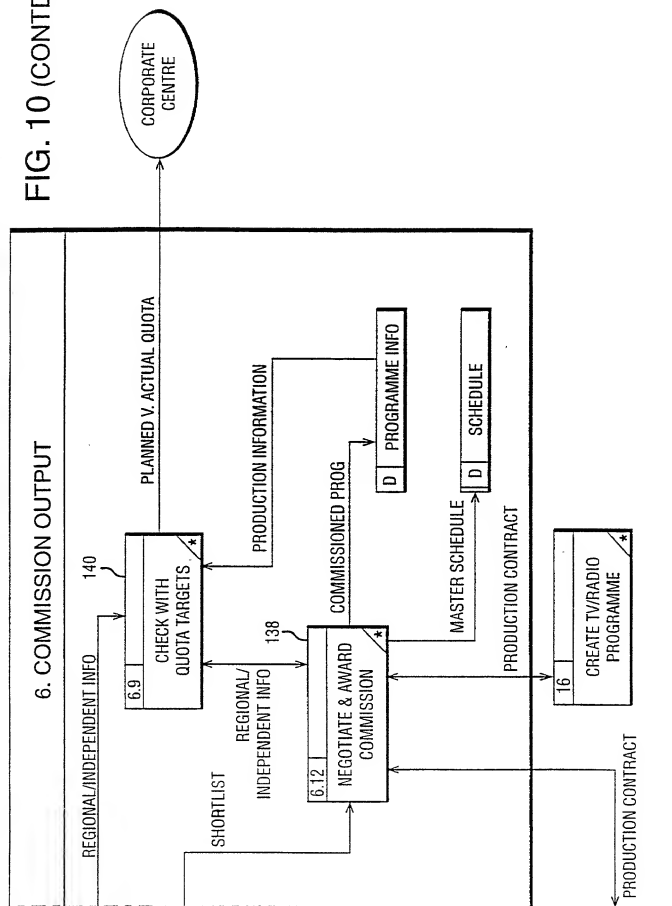


## 6. COMMISSION OUTPUT



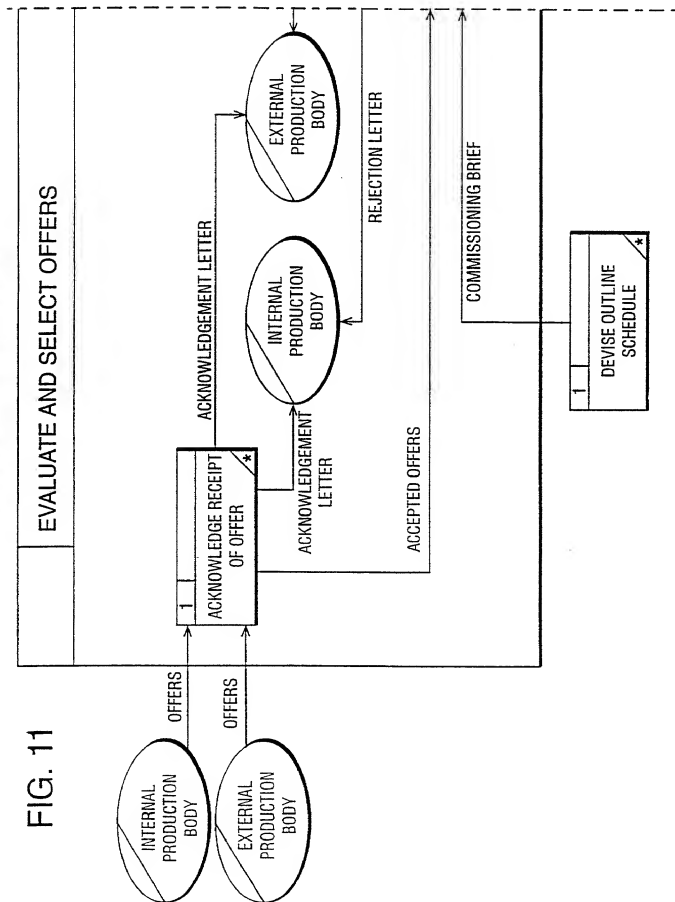
44/77

FIG. 10 (CONTD.)



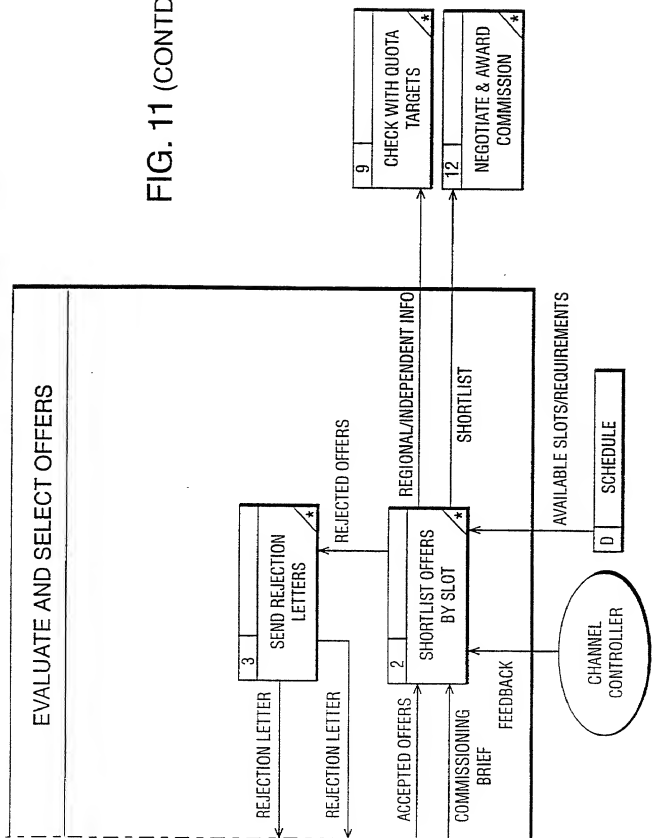
45/77

FIG. 11



46/77

FIG. 11 (CONTD.)



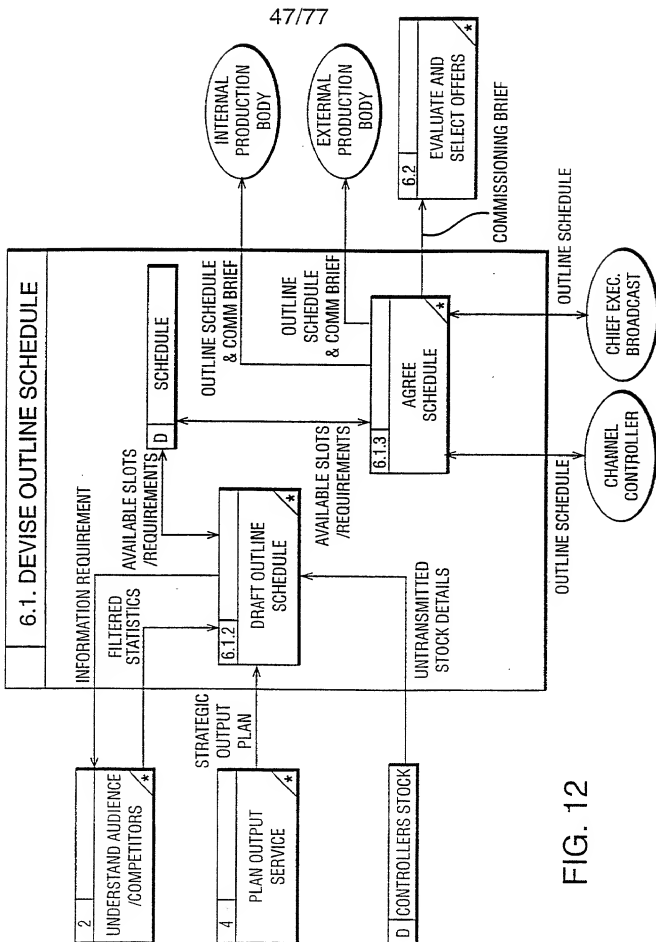
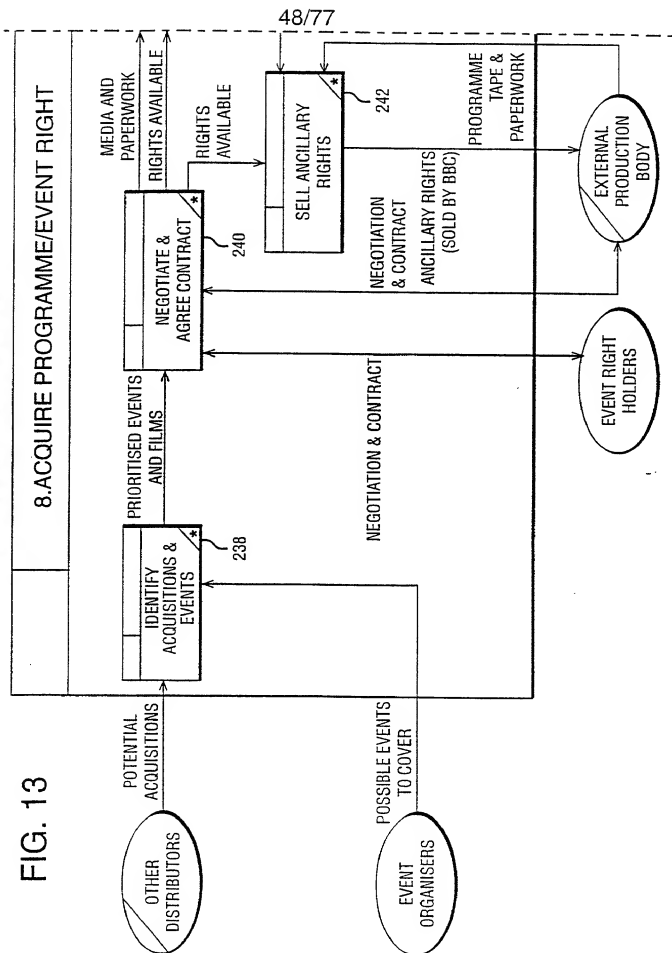


FIG. 12

FIG. 13



49/77

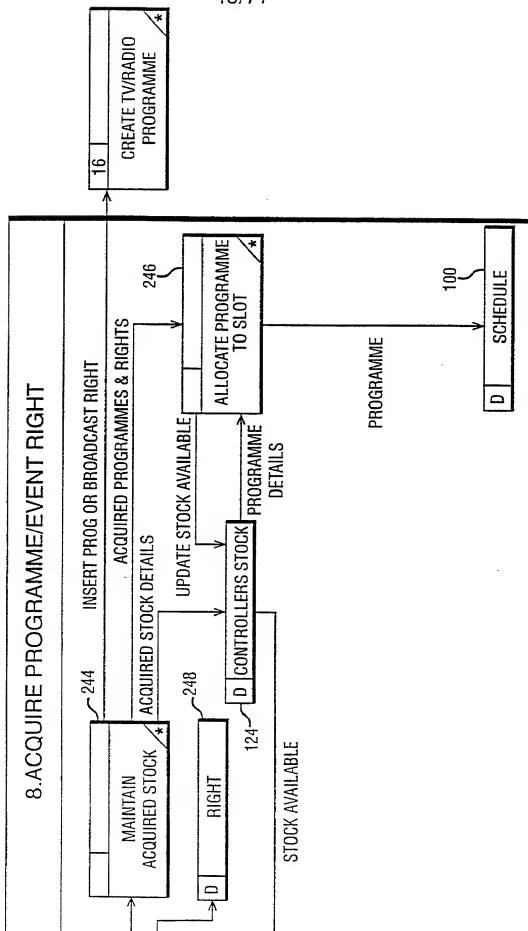
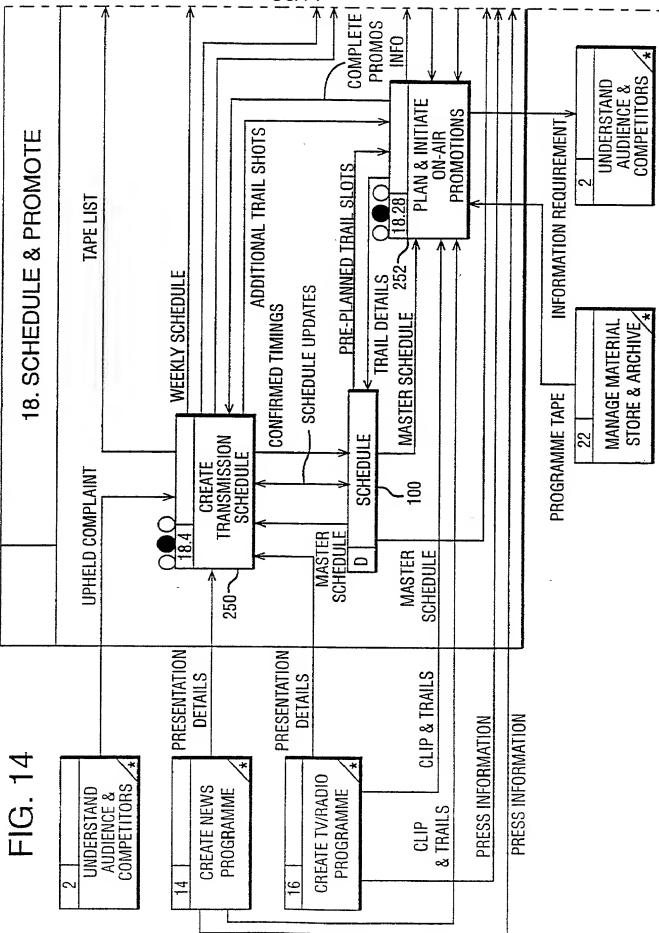


FIG. 13 (CONTD.)

50/77



51/77

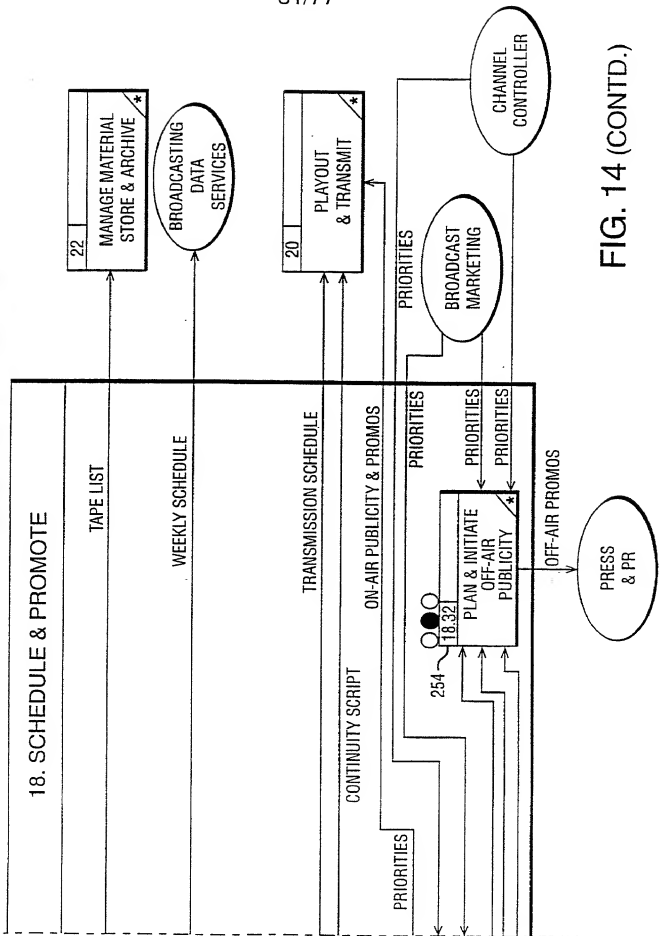
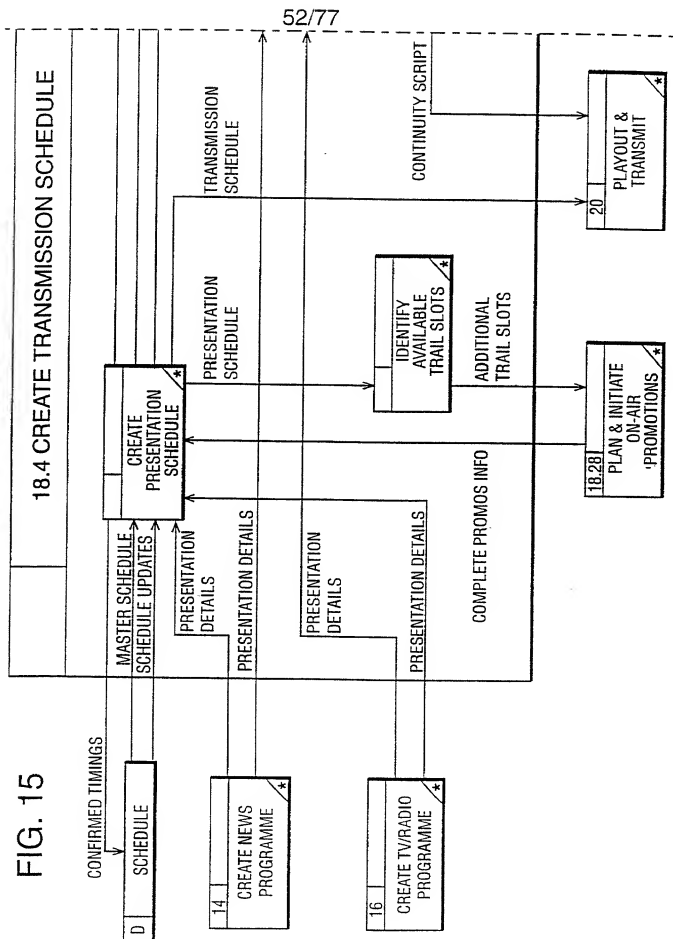


FIG. 14 (CONTD.)

FIG. 15



53/77

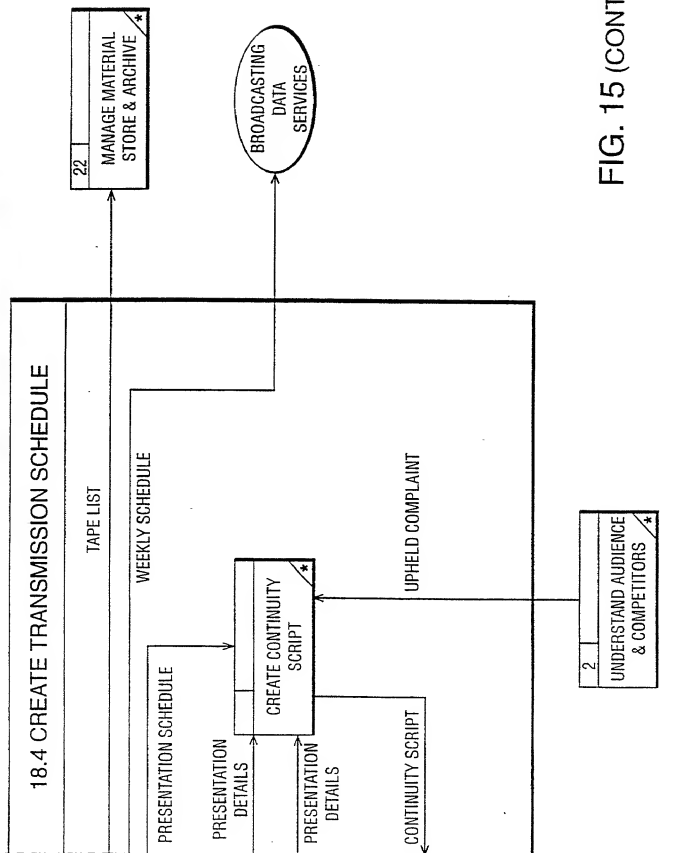
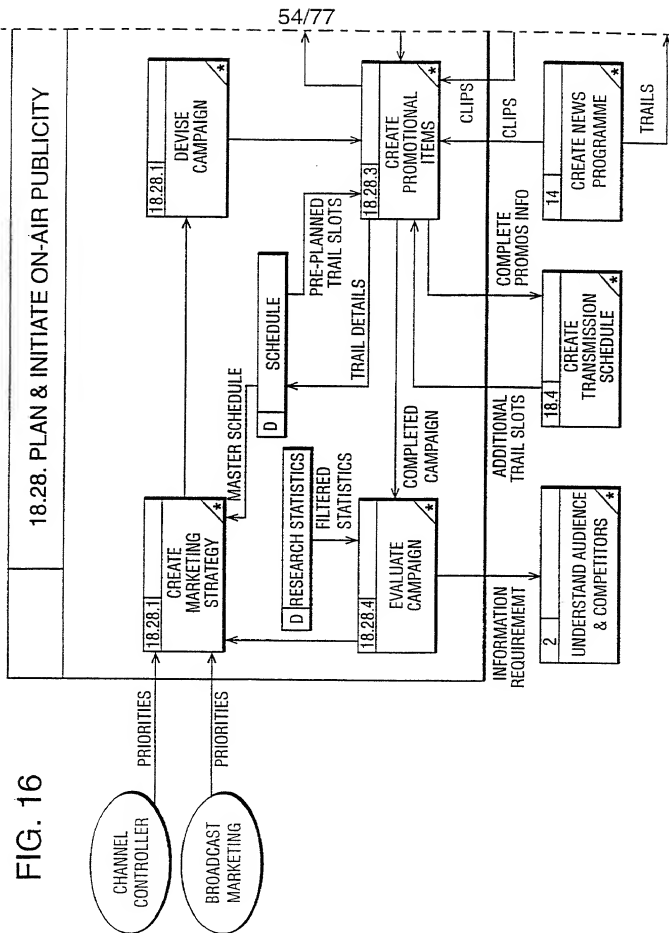


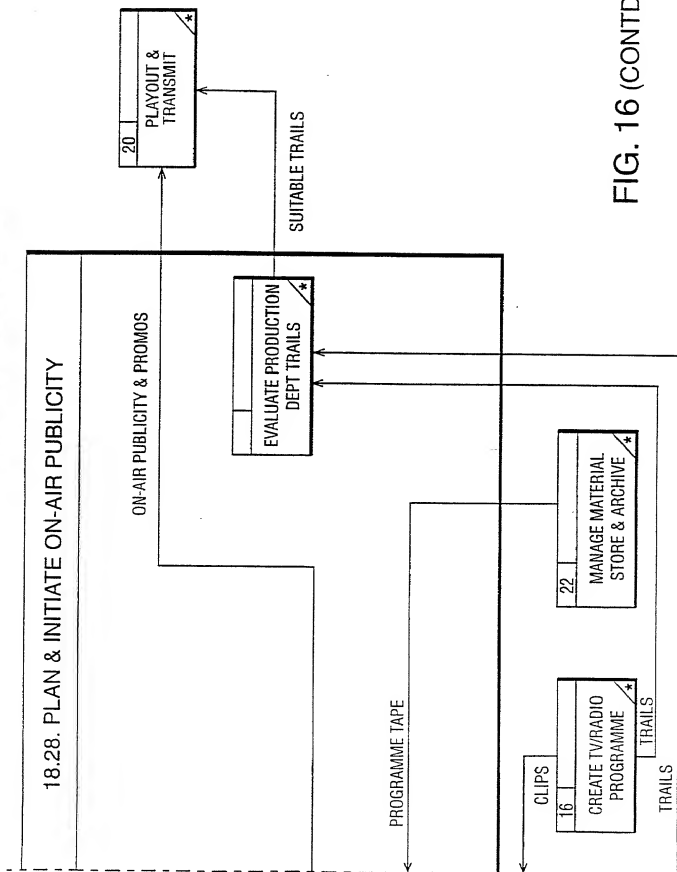
FIG. 15 (CONTD.)

FIG. 16

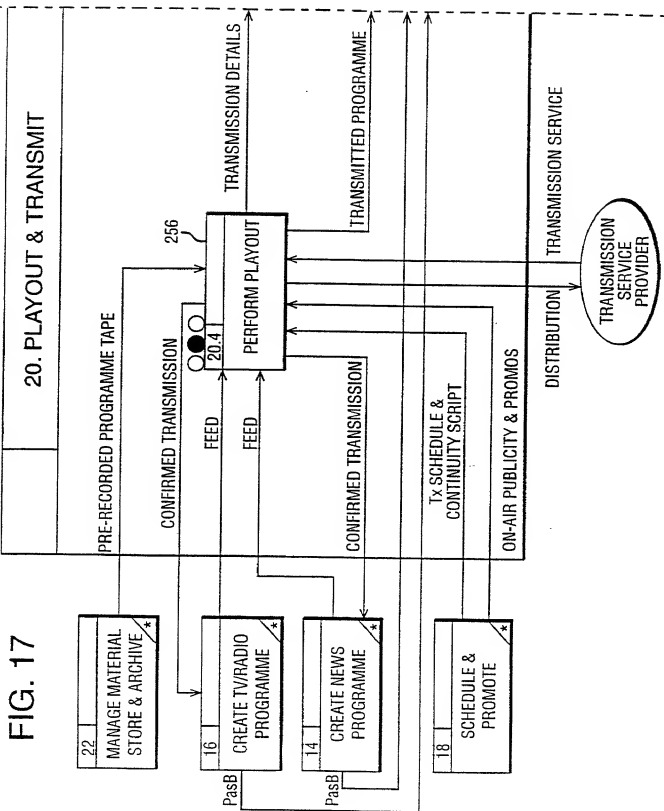


55/77

FIG. 16 (CONTD.)



56/77



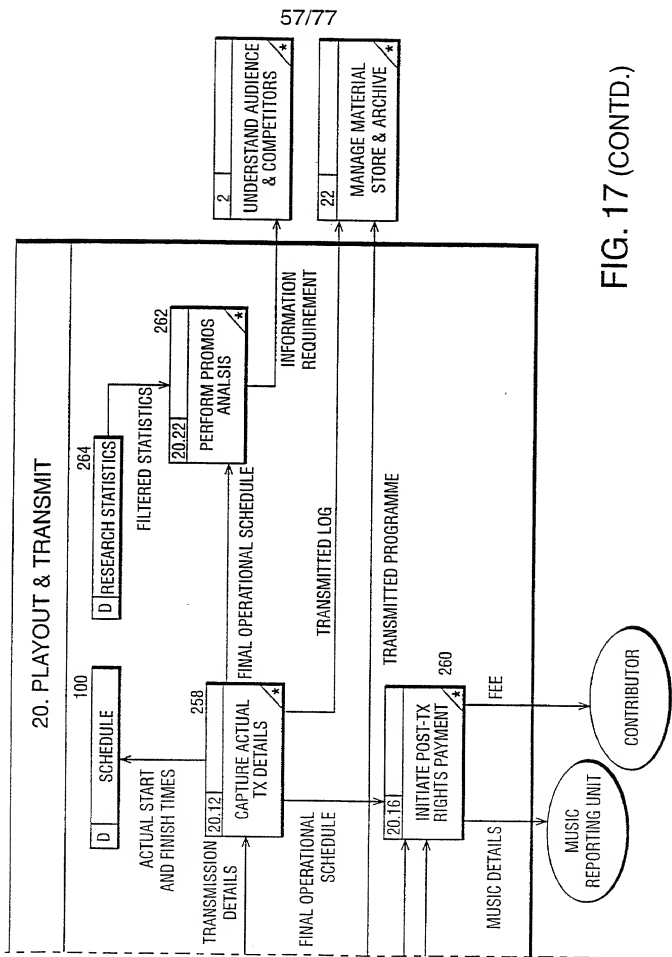


FIG. 17 (CONTD.)

58/77

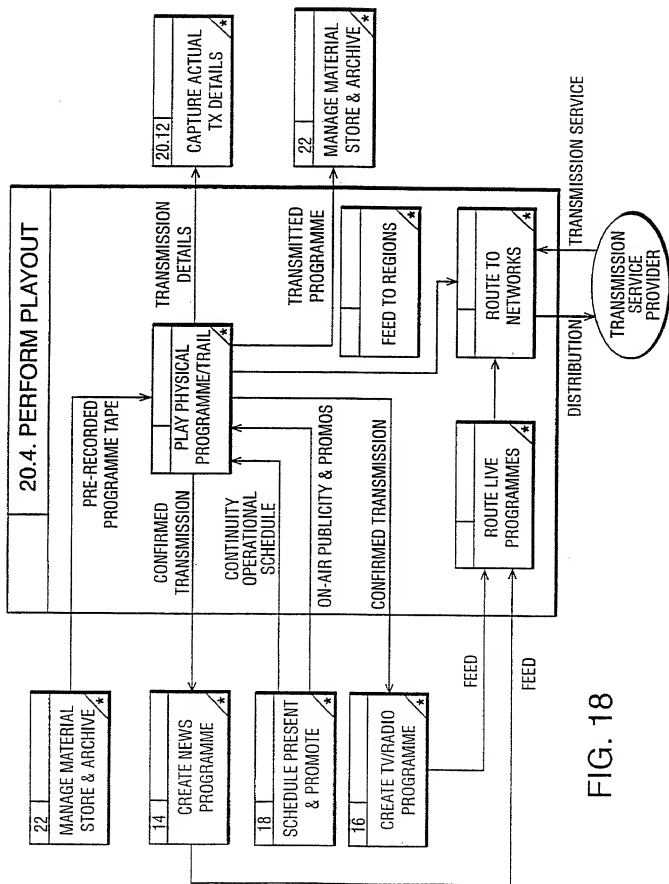
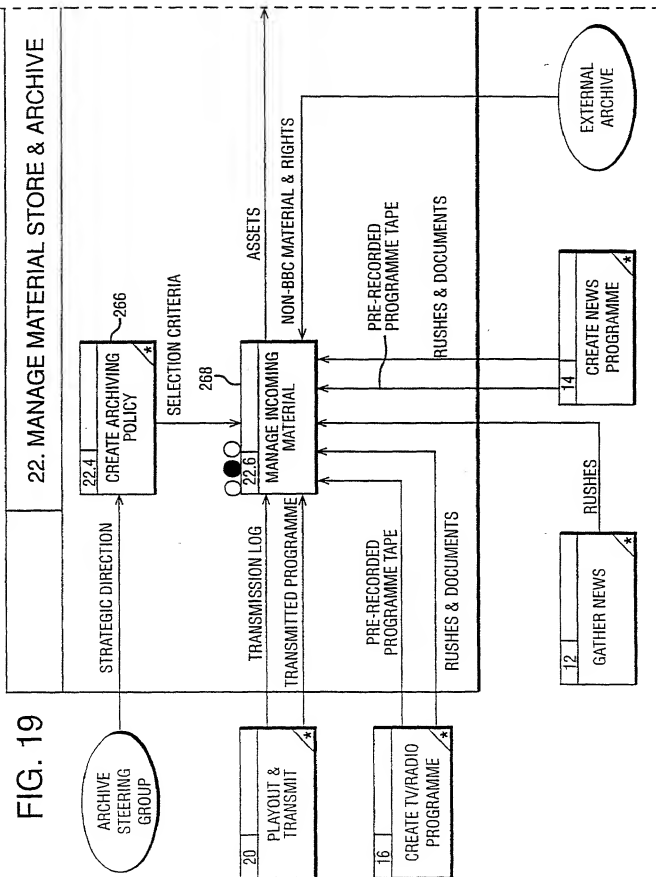


FIG. 18

59/77



60/77

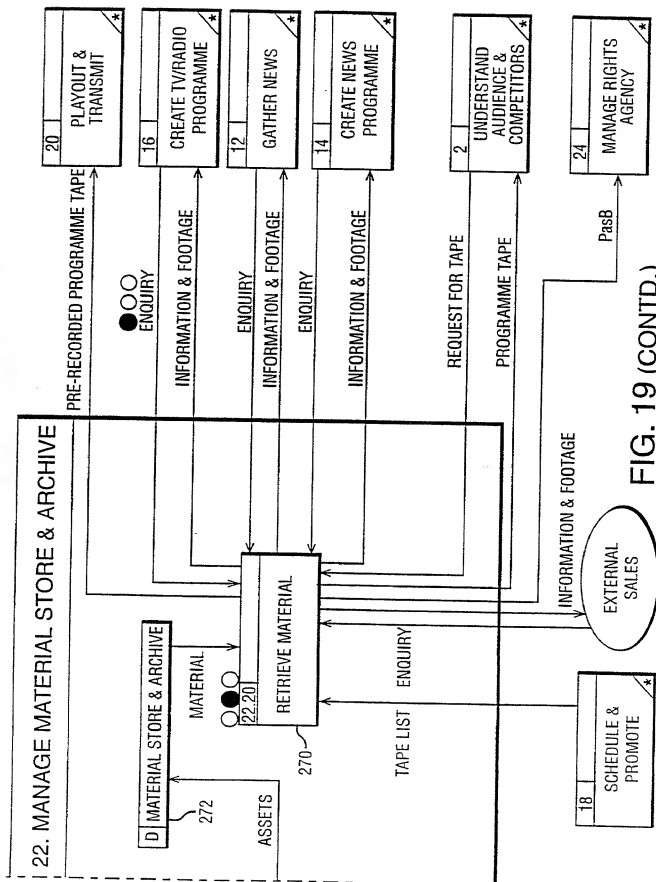
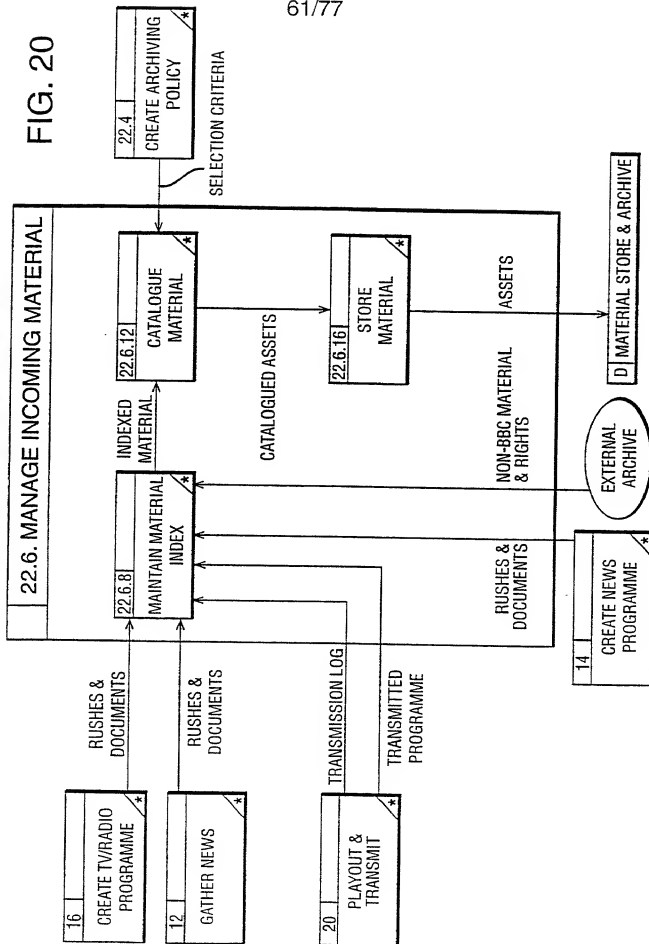


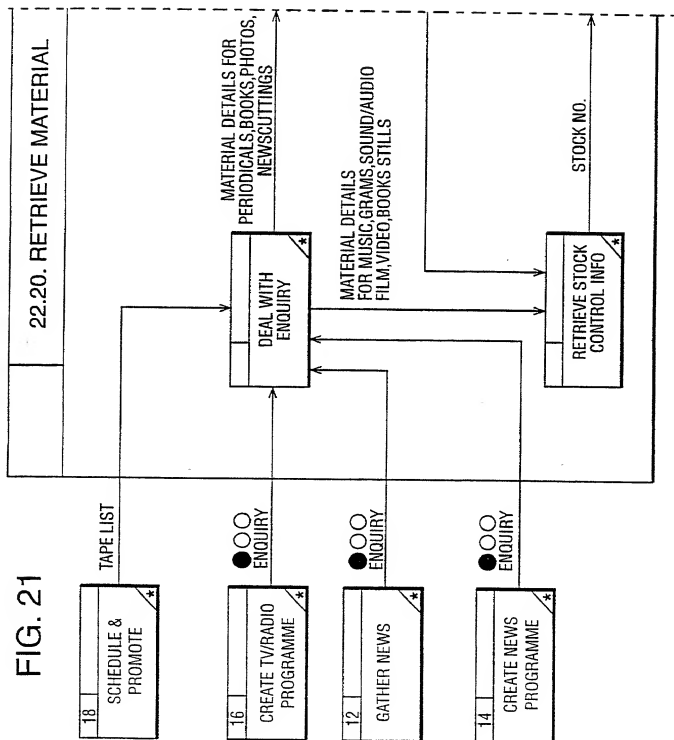
FIG. 19 (CONTD.)

61/77

FIG. 20

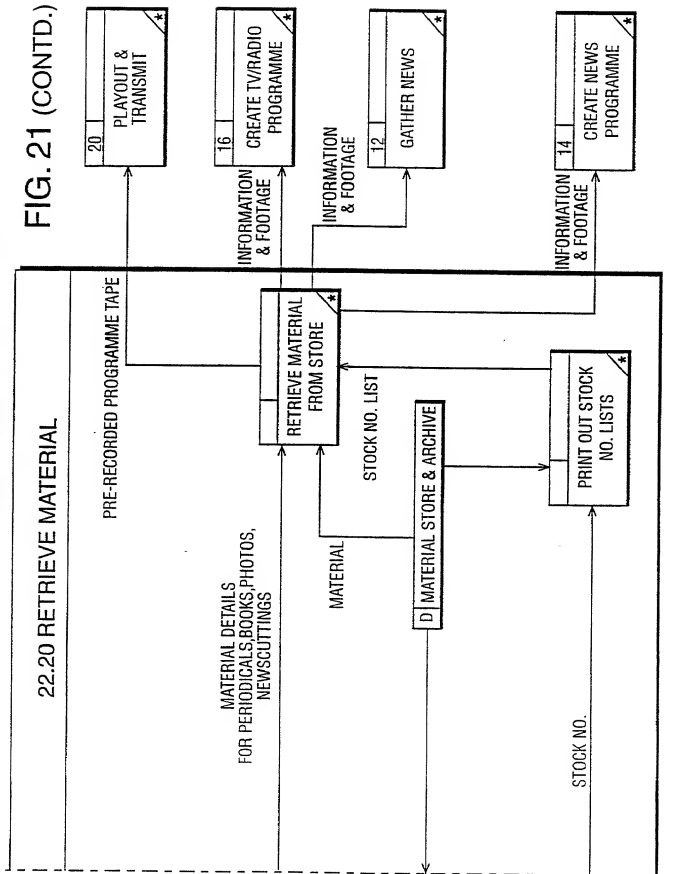


62/77

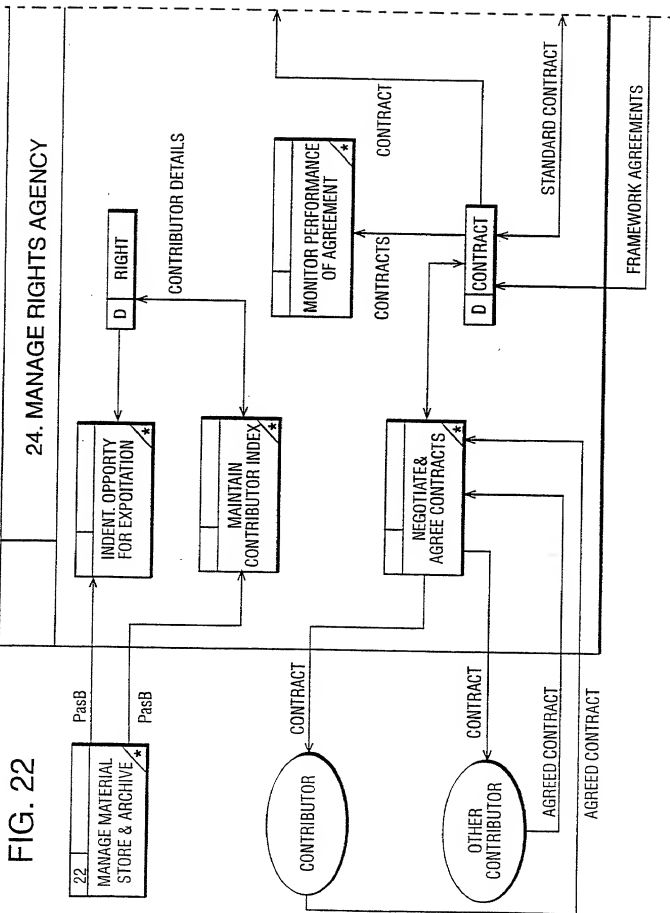


63/77

FIG. 21 (CONTD.)



64/77



65/77

FIG. 22 (CONTD.)

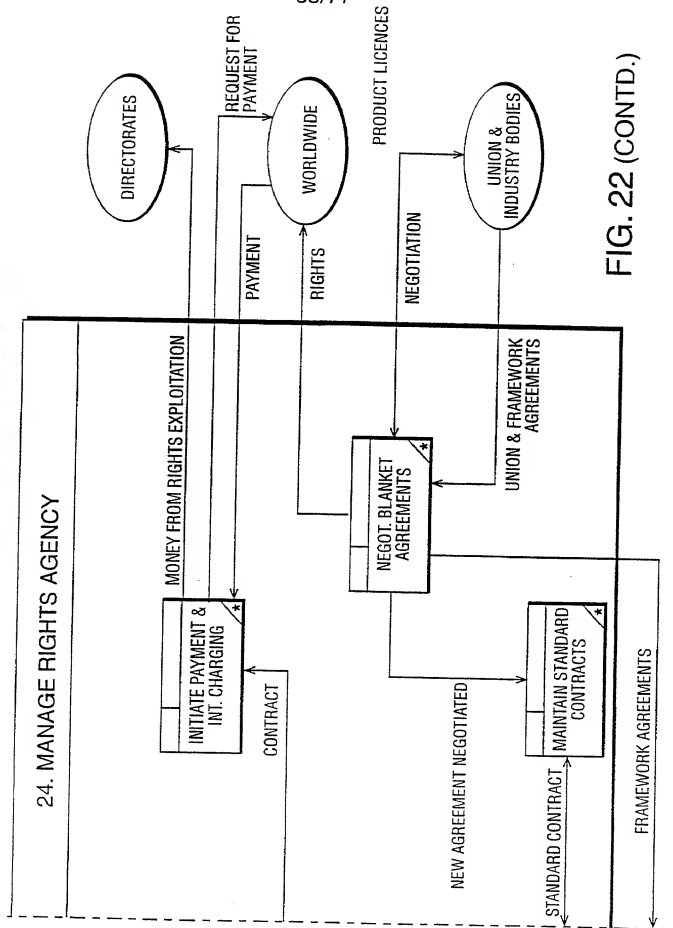
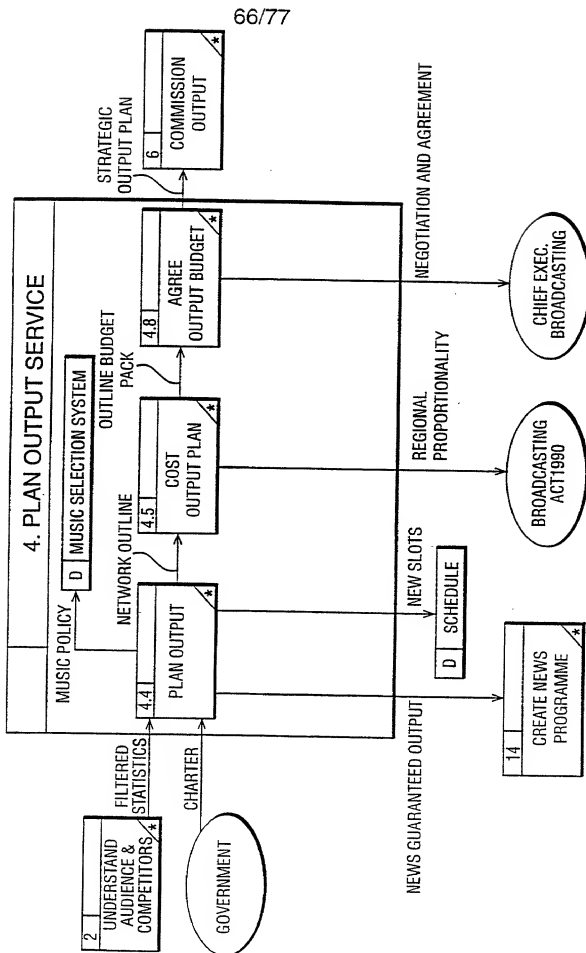


FIG. 23

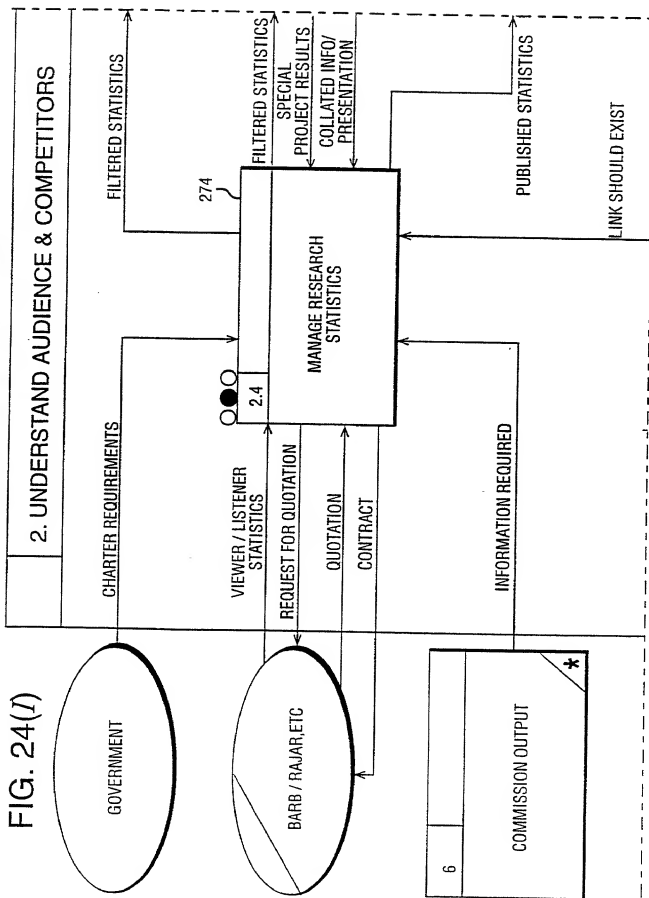


67/77

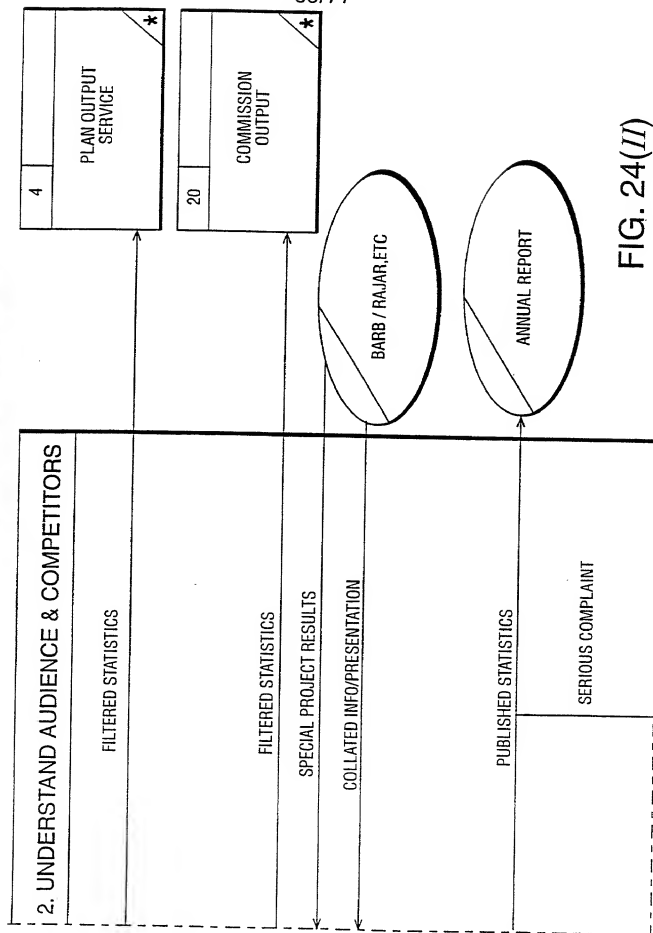
FIG. 24

FIG. 24(I)	FIG. 24(II)
FIG. 24(III)	FIG. 24(IV)

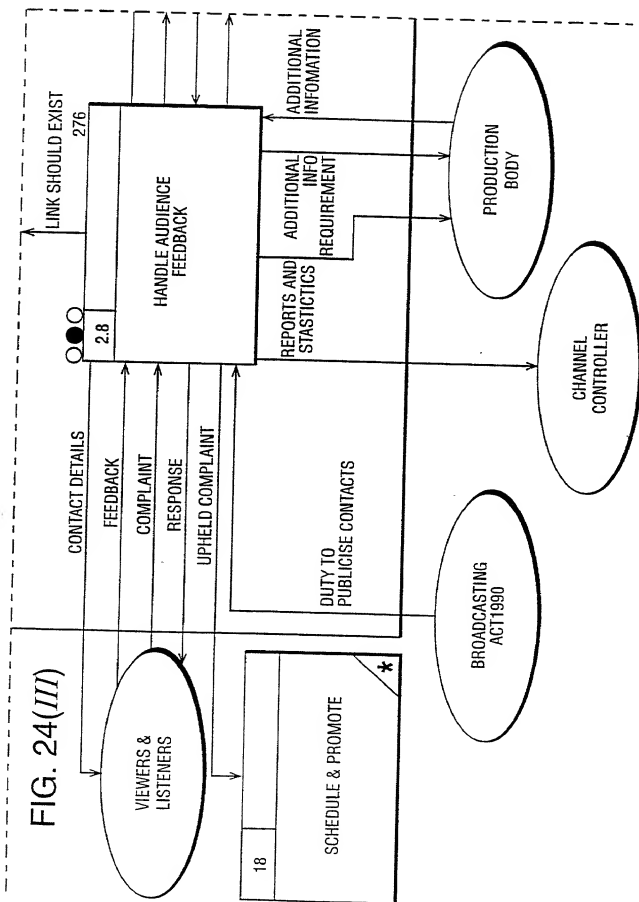
68/77



69/77



70/77



71/77

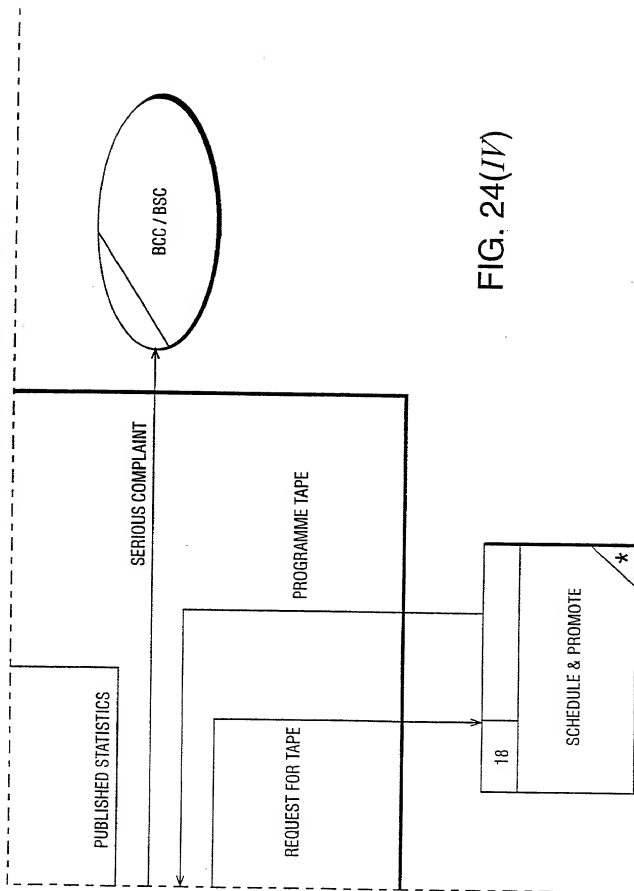
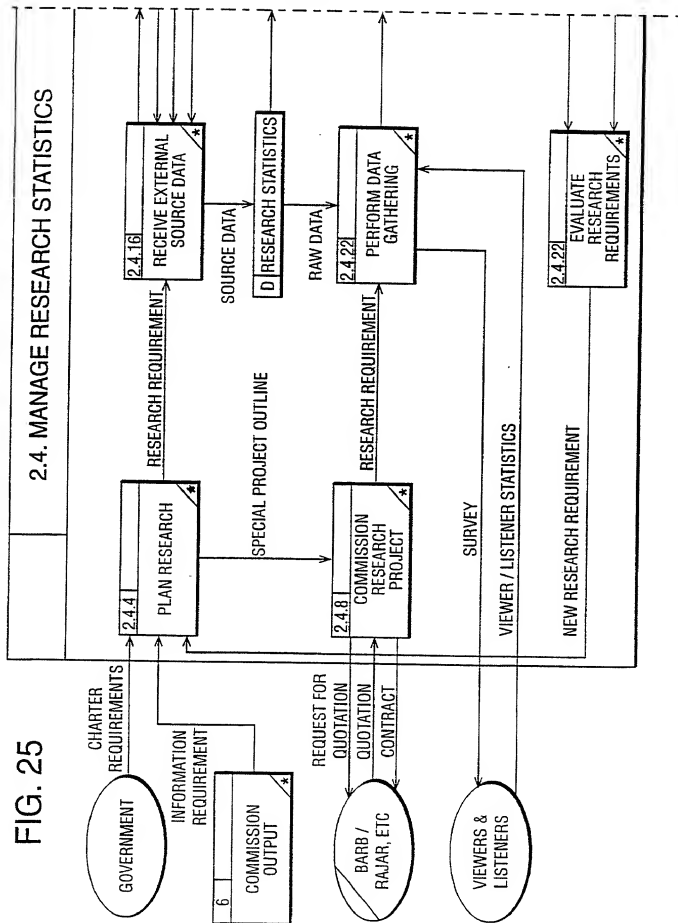
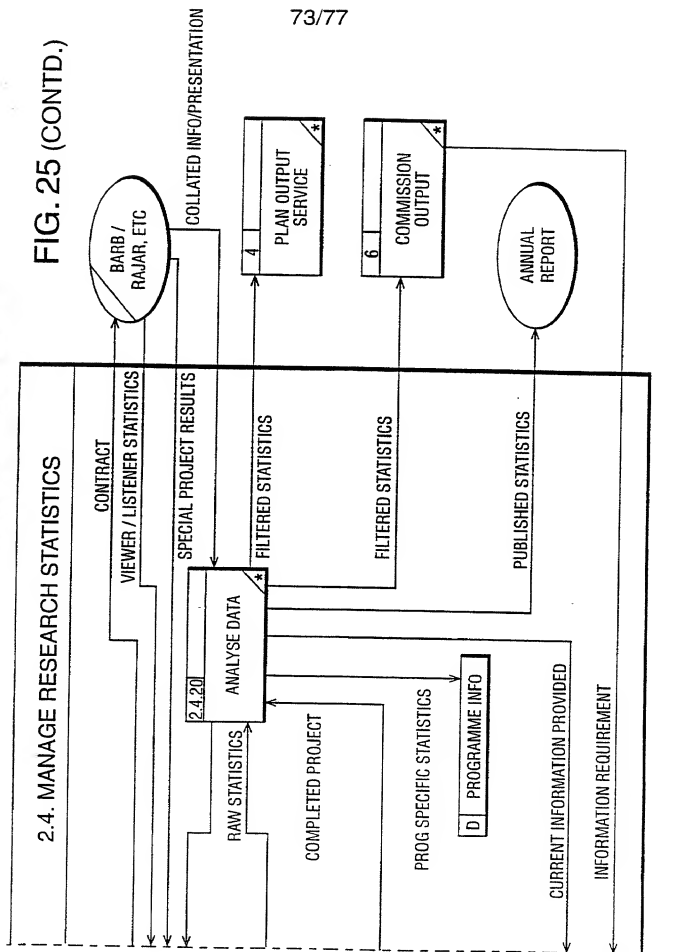


FIG. 24(IV)



73/77

FIG. 25 (CONTD.)



## 2.8. HANDLE AUDIENCE FEEDBACK

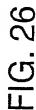
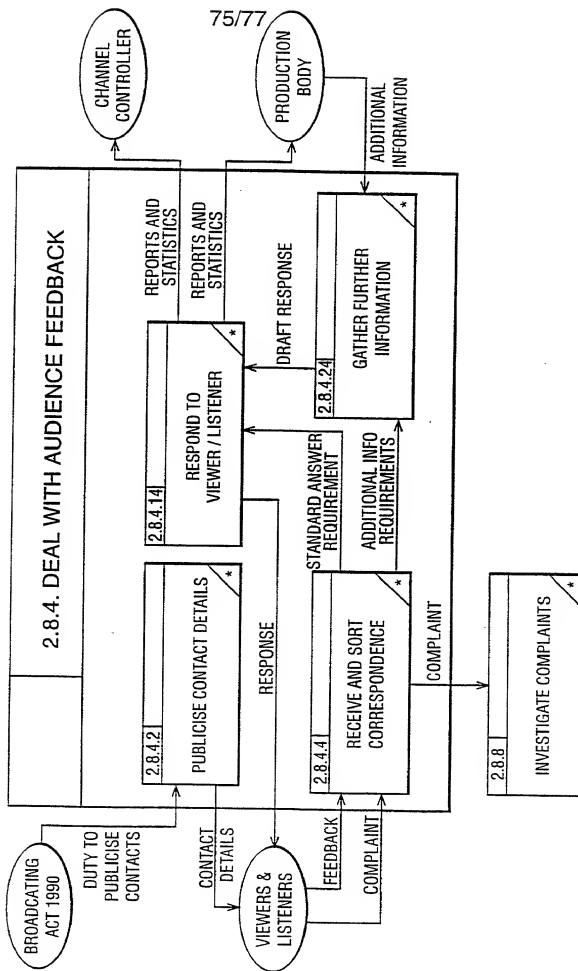
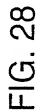


FIG. 27





77/77

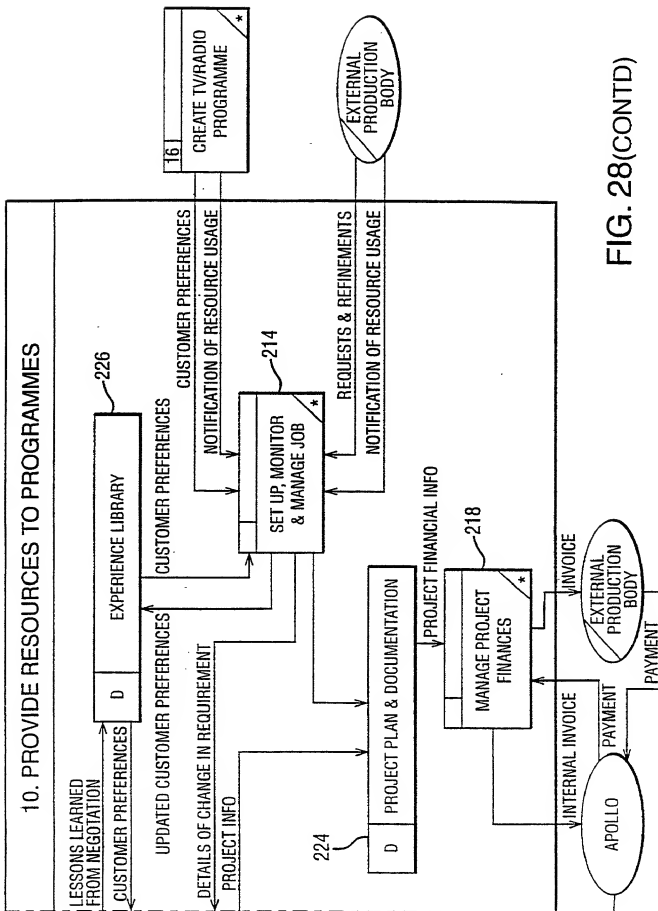


FIG. 28(CONTD)

# DECLARATION FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

## BROADCAST MEDIA METADATA STRUCTURE

the specification of which is attached hereto unless the following is checked: .

☒ was filed on 07/26/01 bearing attorney docket No. R0346/7028.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or section 365(a) of any PCT International application designating at least one country other than the United States listed below and have also identified below any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed:

Prior Foreign PCT International Application(s) and any priority claims under 35 U.S.C. §§119 and 365(a),(b):

			Priority Claimed
09/238,761 (Number)	United States (Country-if PCT, so indicate)	28/01/99 (DD/MM/YY Filed)	<input checked="" type="checkbox"/> <input type="checkbox"/> YES NO
_____ (Number)	_____ (Country-if PCT, so indicate)	_____ (DD/MM/YY Filed)	<input type="checkbox"/> <input type="checkbox"/> YES NO
_____ (Number)	_____ (Country-if PCT, so indicate)	_____ (DD/MM/YY Filed)	<input type="checkbox"/> <input type="checkbox"/> YES NO

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below:

(Application Number)	(filing date)
(Application Number)	(filing date)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s), or §365(c) of any PCT International application(s) designating the United States of America listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

GB 9901807.9	27 January 1999	
(Application No.)	(filing date)	(status-patented, pending, abandoned)
(Application No.)	(filing date)	(status-patented, pending, abandoned)

PCT International Applications designating the United States:

PCT/GB99/03010	10 Sept. 1999	
(PCT Appl. No.)	(U.S. Ser. No.) (PCT filing date)	(status-patented, pending, abandoned)


I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Robert M. Abrahamsen	<u>40,886</u>	Steven J. Henry	<u>27,900</u>	Randy J. Pritzker	<u>35,986</u>
Konstantinos Andrikopoulos	<u>P-48,915</u>	Jason M. Honeyman	<u>31,624</u>	Edward J. Russavage	<u>43,069</u>
Eric Amundsen	<u>46,518</u>	Robert E. Hunt	<u>39,231</u>	Stanley Sacks	<u>19,900</u>
John N. Anastasi	<u>37,765</u>	Ronald J. Kransdorf	<u>20,004</u>	Robert A. Skrivaneck, Jr.	<u>41,316</u>
Ilan Barzilay	<u>46,540</u>	Peter C. Lando	<u>34,654</u>	Alan W. Steele	<u>45,128</u>
Carole Boelitz	<u>P-48,958</u>	M. Brad Lawrence	<u>47,210</u>	Mark Steinberg	<u>40,829</u>
Gary S. Engelson	<u>35,128</u>	Helen C. Lockhart	<u>39,248</u>	Joseph Teja, Jr.	<u>45,157</u>
Neil P. Ferraro	<u>39,188</u>	Matthew B. Lowrie	<u>38,228</u>	Maryanne Trevisan	<u>P-48,207</u>
Thomas G. Field III	<u>45,596</u>	William R. McClellan	<u>29,409</u>	John R. Van Amsterdam	<u>40,212</u>
Stephen R. Finch	<u>42,534</u>	Daniel P. McLoughlin	<u>46,066</u>	Robert H. Walat	<u>46,324</u>
Edward R. Gates	<u>31,616</u>	James H. Morris	<u>34,681</u>	Kristin D. Wheeler	<u>43,583</u>
Richard F. Giunta	<u>36,149</u>	Timothy J. Oyer	<u>28,105</u>	Lisa E. Winsor	<u>44,405</u>
Lawrence M. Green	<u>29,384</u>	Edward F. Perlman	<u>28,105</u>	David Wolf	<u>17,528</u>
George L. Greenfield	<u>17,756</u>	Elizabeth R. Plumer	<u>36,637</u>	Douglas R. Wolf	<u>36,971</u>
James M. Hanifin, Jr.	<u>39,213</u>	Michael J. Pomianek	<u>46,190</u>		

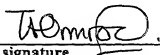
Address all telephone calls to Ronald J. Kransdorf at telephone no. (617) 720-3500. Address all correspondence to:

Ronald J. Kransdorf  
c/o Wolf, Greenfield & Sacks, P.C.,  
Federal Reserve Plaza  
600 Atlantic Avenue  
Boston, MA 02210-2211

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

  
\_\_\_\_\_  
**Inventor's signature**  
Full name of first or joint inventor: CHAN, David  
Citizenship: British  
Residence: 140c Croxted Road  
Dulwich  
GBX London SE21 8NR  
United Kingdom  
Post Office Address: 140c Croxted Road  
Dulwich  
London SE21 8NR  
United Kingdom

20 Sep 2001  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
**Inventor's signature**  
Full name of second joint inventor: ORMROD, Tracey-Anne  
Citizenship: British  
Residence: 4 Fullamoor Farm Barns  
Clifton, Hampden  
Abingdon, Oxon GBX  
United Kingdom  
Post Office Address: 4 Fullamoor Farm Barns  
Clifton, Hampden  
Abingdon, Oxon  
United Kingdom

20 Sept 2001  
\_\_\_\_\_  
Date

**Inventor's signature**

Full name of third joint inventor:

OWENS, Carol, Janet

Citizenship:

British

Residence:

35 Mulgrave Road  
Ealing

London W5 1LF  
United Kingdom

Post Office Address:

35 Mulgrave Road  
Ealing  
London W5 1LF  
United Kingdom

20-9-07  
Date

**Inventor's signature**

Full name of fourth joint inventor:

McGREGOR, Diane, Marie

Citizenship:

British

Residence:

Flat 1, 105 Victoria Road  
London NW6 6TD

United Kingdom  
Flat 1, 105 Victoria Road  
London NW6 6TD  
United Kingdom

Post Office Address:

20.9.01  
Date

**Inventor's signature**

Full name of fifth joint inventor:

CURTIS, Wesley, Jonathan

Citizenship:

British

Residence:

36 Alverstone Avenue  
Wimbledon Park  
London SW19 8BE

United Kingdom  
36 Alverstone Avenue  
Wimbledon Park  
London SW19 8BE  
United Kingdom

Post Office Address:

20th Sept. 2001  
Date

**Inventor's signature**

Full name of sixth joint inventor: JORDAN, Smith, John

Citizenship: British

Residence: 93 Bedford Road  
Walthamstow

Post Office Address:

London E17 4PU  
United Kingdom  
93 Bedford Road  
Walthamstow  
London E17 4PU  
United Kingdom

20/9/01  
Date

**Inventor's signature**

Full name of seventh joint inventor: HAYNES, Arthur, Brian

Citizenship: British

Residence: 50 Hillcrest Road  
Camberley

Post Office Address:

Surrey GU15 1LG  
United Kingdom  
50 Hillcrest Road  
Camberley  
Surrey GU15 1LG  
United Kingdom

20/9/01  
Date